

**Data Validation Report**

TDD No: 09-04-01-0011
PAN: 001275.0440.01TA
Site: El Dorado Hills
Laboratory: Lab/Cor, Inc.
Reviewer: Denise A. Shepperd, Trillium, Inc.
Date: May 19, 2005
 Revised August 11, 2005

I. Case Summary**SAMPLE INFORMATION:**

Asbestos Samples:	APG-L2-13CH-100404; APG-L2-1CH-100404; and CC1-L6-3CB-100204
Matrix:	3 Air samples
Analysis:	Asbestos by Transmission Electron Microscopy
Collection Dates:	October 2 through 4, 2004
Sample Receipt Date:	October 7, 2004
Filter Preparation Date:	January 7, 2005
Grid Preparation Date:	January 21, 2005
TEM Analysis Dates:	February 7 and 8, 2005
Analytical Method:	ISO Method 13794

FIELD QC:

Field Trip Blanks (ZB):	NFB-L2-1ZB-10050; SFBB-L2-1ZB-10060; NYB-L2-1ZB-10070; JEG-L2-1ZB-10070; SRA-1ZB-1008004
Filter Blanks (FB):	SFBA-L2-FB-10050; JEG-L2-FB-101004; NRA-FB-101004
Column Balnk (FB):	NRA-FB-101005
Equipment Blanks (EB):	
Method Blank (MB):	4 glass filter blanks
Field Duplicates (D1):	Not Identified

TABLES:

- 1A:** Analytical Results with Qualifications
1B: Data Qualifier Definitions for Inorganic Data Review

SAMPLING ISSUES:

No chain of custody documents were provided in the data package. Chain of custody documentation that included these samples was provided on 5/4/05 by electronic transfer, at the request of the validator.



VALIDATION PARAMETERS AND COMMENTS:

I. Holding Times, Preservation and Sample Integrity

This parameter is evaluated to ensure that sample custody is documented from collection through analysis, samples are analyzed within the recommended holding time, and that no alteration in sample content has occurred during sample shipment, handling, and storage.

There is no established holding time or storage condition for asbestos samples.

II. Calibration

The analyses of materials of known content ensures that identification and quantitation of analytes will be accurate for all samples. Review of the documentation provided for appropriate calibration determines whether or not the analytical results reported by the laboratory are valid and supported by the data.

The data deliverables for this project were included in multiple data packages in several shipments. Instrument calibration documentation was provided in a separate data package in association with the site sample data packages in this shipment and included camera and screen magnification calibration (performed 4/7/05 to 4/13/05), camera length and constant calibration (performed 4/5/05 to 4/14/05), EDS peak resolution check (performed on 4/7/05), and maintenance logs for both instruments used for analyses, covering the months of March and April of 2005. Previous data packages received for this project included instrument calibration for the months of 10/04 through 12/04. The analyses of the three samples in this data set were performed on 2/7/2005 and 2/8/2005; documentation of these parameter checks was not included for the month of 2/05.

A form entitled "Microscope Based Quality Control" for the month of April 2005 was included. This form listed the various instrument calibration parameters, required frequencies, dates performed, and results. According to this form, k-factor calibration was performed most recently on the two microscopes on 1/11/05 and 3/14/05; beam dose was calibrated on 2/9/05 and 3/18/05.

No documentation of grid opening size was provided.

Documentation to support the identification and quantitation in the site samples in these data packages was provided separately with a previous shipment of data packages from the same project, and included the following:

A letter representing documentation of an NVLAP laboratory site assessment conducted on 11/7/03 was included in the data package. The letter, dated 5/10/04, indicated that the laboratory met the on-site assessment requirements.

Results and evaluator notes and tables were included for an NISTIR 5351 analysis of an inter-laboratory QC sample. The laboratory's raw data were compiled and assessed by Batta Labs. Analysts were identified by initials and included one of the two analysts' initials documented with this sample set. "DW" and "KM" performed these PE sample analyses, "JH" was not represented. According to the assessor's notes, the sample included chrysotile fibers and structures and the laboratory's results were within NVLAP and NISTIR 5351 acceptance limits. No raw data were provided for this QC sample in the original data package. Raw data were provided under separate cover, at the request of the validator.

Results for a New York State Department of Health Environmental Laboratory Approval Program proficiency test, conducted between 9/7/04 and 11/9/04, were also included. The proficiency samples included asbestos in air. The laboratory's results were satisfactory for all four of the air sample categories. Actinolite and amosite fiber types

were identified and counts were acceptable, according to the data sheet. No raw data were provided for this proficiency sample. Upon request, the laboratory provided raw data documenting the identification of actinolite and amosite asbestos on 1/27/05, in conjunction with the validation of a previous shipment of data packages. These data were inserted by the validator into the QC data package provided, as supporting data, with the previous shipment of data packages.

Documentation for a round-robin sample analyzed in the fall of 2004, by three separate laboratories, as part of the NVLAP requirements, was also included in the QC data package. The documentation included raw count sheets and reported results, as well as comparison with other laboratories' results. Results for all parameters were acceptable. According to the documentation, the only analyst who participated in these analyses was "DW."

Based on the fact that the laboratory demonstrated proficiency in the performance evaluation (PE) analyses performed in the third quarter of 2004, and that these PE samples included the two predominant asbestos types detected in this field sample set, no action was taken by the validator.

III. Blanks

Sample matrices known to be devoid of the analytes of interest (method blanks) are prepared and analyzed with each analytical batch. Evaluation of this parameter ensures that contamination introduced during preparation and analyses is not attributed to the field samples.

Other blanks may be generated in the field or laboratory to ensure that no contamination is introduced during sampling and/or storage.

No field-generated blanks were included with this data set.

The laboratory preparation list and log indicated that one laboratory preparation filter blank was prepared and analyzed by the indirect method in association with the entire 70-sample set (041172, 041188, 041191, 141210, and 050680). No raw data were supplied for this blank, but a value of "0" structures detected was present on the QC summary form. According to the prep sheets, this blank was prepared on 1/13/05 (ashed and "hydrolyzed") and 3/16/05 (grid preparation), while the field samples were prepared on 1/7/05 and 1/21/05. This blank would be an indicator of any contamination present in the blank filters used for preparation and for any contamination present in the prep lab environment on 1/13/05 and 3/16/05, but it does not address contamination issues for the dates on which the samples in this data set (041172) were prepared.

The indirect method used (ISO 13794), recommends analyzing a filter blank and a beaker blank with each set of samples prepared. In addition, it is recommended that the laboratory include an unused filter for preparation with every microscope slide containing sample filters that is prepared. None of these blanks were documented with this data set. Without blanks it is not possible to assess the presence or absence of laboratory contamination or its impact on the site sample results.

The laboratory had prepared blanks with the preparation and analyses of samples in this data set. At the client's request the laboratory analyzed a percentage of the prepared blanks. Data for these blanks were received by the validator on July 6, 2005. Four filter blanks, five field trip blanks, four glass filter blanks, and one column blank were prepared and analyzed as laboratory blanks. No asbestos structures were detected in any of the blanks.

IV. Spiked Samples

The analytes of interest are added in known concentrations to like-matrix blanks or authentic field samples before preparation. This parameter is evaluated in order to assess the laboratory's ability to preserve and recover the compounds of interest.

The analytical method does not require laboratory spiked sample analyses. It is recommended by the validator that some type of laboratory prepared or purchased spiked analyses be performed with each analytical sample batch.

The project requirements specified that results from the most recent inter-laboratory study would be acceptable as a laboratory control sample (LCS) for these data. This requirement was met by the laboratory and results, reported with previous data submissions for this project, for the inter-laboratory study sample were acceptable for all air sample parameters (see Section I). The data user should note, however, that no reference material was prepared and analyzed by the indirect method (ISO 13794) employed for the preparation and analyses of the site samples. This method is used when filter loading is too high to allow the use of the direct method (ISO 10312) and depends on recovery of material from the air-sampling filter, resuspension in solution, effecting a dilution, and redistribution onto a secondary filter which is then prepared as for the direct TEM analysis method. Because there are additional steps involved in the preparation, there are additional error factors introduced. It is recommended that a reference material be prepared and analyzed by the indirect method so that performance can be tracked by the laboratory for support of field sample analyses by this procedure.

V. Duplicate/Replicate Samples

Results for duplicate/replicate samples are evaluated to assess the laboratory's precision for the analytes of interest in the applicable sample matrix. For asbestos analyses, duplicate and replicate measurements take the form of a combination of variables which include the preparation of the grid, the choice of grid openings to be analyzed, and the analyst performing the counting and identification of structures. For the indirect method the variables should also include preparation of the filter itself.

The laboratory included all of the QC samples from all of the field sample sets in this shipment in a separate data package under a separate report number (050580).

One of the two analysts, JH, not represented in the PE sample analyses included with the data packages for this project did perform intra-laboratory replicate and duplicate analyses on associated field samples. Results for these QC analyses for this analyst were within the sample-specific acceptance limits stipulated by the method.

The quality assurance project plan (QAPP) requires five types of laboratory duplicate/replicate analyses, each to be performed at a rate of 5% (one for every twenty) of the field samples. Based on the total of samples prepared by the indirect method and included in all of the data packages in this shipment combined (70 samples), four or more of each of these QC sample pairs were required (a total of 20 QC sample pairs).

The laboratory compared the primary asbestos structure count for each of the QC samples prepared and analyzed. Results for all of the duplicate/replicate pair types were evaluated based on 95% confidence limits determined from the original sample count result. Results for all of the reported QC samples were within the laboratory's calculated limits.

None of the samples in this data set (041172) was prepared as a replicate or duplicate pair. The laboratory analyzed a total of 11 QC sample pairs from the other three associated data sets. A summary of the laboratory QC samples analyzed is as follows:

Replicate analyses:

- Two samples were analyzed as replicates, wherein a different preparation was analyzed by the same analyst;

Duplicate analyses:

- Three samples were analyzed as duplicates, wherein the same grid openings were recounted by a different analyst;
- Three samples were analyzed as duplicates, wherein different grid openings were selected for counting by a different analyst;
- Three samples were analyzed as duplicates, wherein a different analyst counted a different preparation.

No samples were analyzed as replicates, wherein the same analyst re-counts the same sample a second time counting different grid openings.

According to the preparation list and log, two samples (from 041188 and 041191) were re-prepared on 3/29/05 and 3/30/05. The second preparation of these two samples involved ashing the filters for two hours, according to notes on the prep list. It was assumed by the validator that these were the only samples which were carried through all of the filtering and grid preparation steps. Other QC samples listed as repreps were assumed to be additional grid preparations from the same filter only.

Agreement between the results for the 11 sample QC pairs analyzed in conjunction with the combined project-related laboratory batches in four of the required categories were acceptable. In addition, four samples were re-analyzed by the same analyst counting the same grid openings. These results were also acceptable according to the laboratory-specified limits. This category was not included as a requirement in the project QAPP.

The data user is cautioned that although the laboratory QC counts met the specified criteria, the acceptance range includes as much as a three-fold difference in asbestos concentrations for these samples. This range of variability is applicable to all asbestos results in this data set.

According to the QAPP provided with the data packages, field duplicates were required at a rate of 10% of field samples. Field duplicate pairs were not identified or evaluated as part of this validation effort.

VI. Identification

Identification of asbestos structures and fibers is dependent on sample preparation techniques, analyst training, instrument operation, and data interpretation. Comparison with results from known standards is used to evaluate the accuracy of the structure identification for field samples.

Actinolite, chrysotile, and tremolite were identified in the field and QC samples. According to the report forms provided in the QC package included with a previous data package shipment for the project, the laboratory correctly identified actinolite, chrysotile, and amosite in PE sample analyses performed in the third quarter of 2004. Comparison of identification between the various analysts, grid opening, and preparations combinations that make up the daily QC for these analyses, included separately with this shipment of data packages, were within acceptance limits. Therefore; based on the documentation provided, fiber and structure identifications for chrysotile, and tremolite/actinolite were determined to be valid as reported.

VII. Quantitation and Reported Detection Limits



Raw data documentation is reviewed to ensure that all reported results and detection limits are correctly calculated, accurately reported, and supported by the raw data.

Results for asbestos categories, fiber density, and detection limits were correctly calculated and accurately reported by the laboratory, with one exception. Results were verified by the validator using the information included on the reporting forms and the chain of custody records.

The aspect ratio for the bundle identified and verified as chrysotile at grid location E123 in APG-L2-1CH-100404 was recorded as 2.0 by the analyst on the count sheet. This is below the 3:1 aspect ratio required for AHERA structures. This bundle should not be included in the count for AHERA categories. Results for total AHERA structures, AHERA structures >5, and AHERA structures 5-10 were corrected by the validator on the report form, data summary form (Table 1A) and in the electronic deliverables.

VIII. System Performance

This parameter is evaluated to ensure that the laboratory analytical systems were functioning properly at the time of analyses and that methodology appropriate to the analyses were followed.

The analytical systems appear to have been working satisfactorily and to have been calibrated properly at the time of these analyses, based on the documentation provided in this data package shipment. Grid opening calibration and spot size calibration were not documented.

IX. Documentation

Data and documentation completeness is critical in providing support for the reported results. Problems encountered with the nature or quality of the data package documentation are addressed.

No raw data were provided in the data package for the proficiency samples analyzed in support of the laboratory's accreditation. Raw data to support the identification of actinolite and amosite were received upon request on 1/26/05 in conjunction with validation of a previous shipment of data from the same project.

Raw data for chrysotile fibers identified in only selected field samples from this data set were provided.

Count sheets included in the data package are computer generated forms. No date of the actual count is presented on these forms. If there is a corresponding bench sheet from which these forms are prepared, these should be supplied as a part of the data package. It is recommended that analyst's initials and date of count be added to the documentation.

The legend for the count sheets, which defines the codes used for the structure counts lists PSCH as the code for protocol chrysotile structures. The code appearing on the count sheets for this category is PCAS.

COMMENTS:

- A. The aspect ratio for the bundle identified and verified as chrysotile at grid location E123 in APG-L2-1CH-100404 was recorded as 2.0 by the analyst on the count sheet. This is below the 3:1 aspect ratio required for AHERA structures. This bundle should not be included in the count for AHERA categories. Results for total AHERA structures, AHERA structures >5, and AHERA structures 5-10 were corrected by the validator on the report form, data summary form (Table 1A) and in the electronic deliverables.



- B. According to the laboratory report form (Form I) and the count sheet the number of grid openings counted for sample CC1-L6-3CB-100204 is 56. Concentrations, analytical sensitivity, and detection limit calculations performed by the laboratory were consistent with 56 grid openings. The value listed on the sample preparation log is 88. This value was corrected by the validator to match the number reported on the report form.

ADDITIONAL COMMENTS:

The laboratory reported results, analytical sensitivity, and detection limits to three significant figures. The data user should be aware that because all of these values are based on the counting of whole asbestos structures, the appropriate number of significant figures will be limited by the structure count. A total count of eight fibers will warrant results with only one significant figure; a count of 12 will warrant two, etc. Because the analytical sensitivity and detection limit are calculated from an assumed single asbestos structure, only one significant figure is accurate for these values, rather than the three reported by the laboratory. A second significant figure, if used, is considered estimated. The validator-calculated results, analytical sensitivities, and detection limits varied from the laboratory values in many cases, however, these discrepancies appeared to be due to rounding. The validator did not adjust the laboratory results to reduce the number of significant figures.

It is recommended that complete instrument calibration documentation be provided with every data package to fully support the site sample results.

The data results tables included as Table 1A include only the primary and total asbestos structure counts. Counts for individual categories required by the project Scope of Work are presented in the associated electronic data deliverables (EDD) tables.

This report was prepared according to the specifications of the analytical method, ISO Method 13794 “Ambient air - Determination of asbestos fibres - Indirect-transfer transmission electron microscopy method,” the document “USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,” 10/99, and Trillium, Inc.’s SOP No. 0497-06A, for Validation of Analytical Data: Inorganic Analytes.

Table 1A
Analytical Results with Qualifications
Asbestos in Air Samples

C-sample-num	Type	# of structures counted	Concentrations	Units	Analytical sensitivity (AS)	Lower	Upper	Val Adj Result Conc.	Val Qual	Val Adj AS	Val Units	Val Comm
APG-L2-13CH-100404	Primary Asbestos Structures	70	0.07	structure/cc	0.001	0.0546	0.0884				structures/cc	
APG-L2-13CH-100404	Total Asbestos Structures	70	0.07	structure/cc	0.001	0.0546	0.0884				structures/cc	
APG-L2-1CH-100404	Primary Asbestos Structures	7	0.007	structure/cc	0.001	0.00281	0.0144				structures/cc	A
APG-L2-1CH-100404	Total Asbestos Structures	7	0.007	structure/cc	0.001	0.00281	0.0144				structures/cc	A
CC1-L6-3CB-100204	Primary Asbestos Structures	100	0.156	structure/cc	0.00156	0.126984	0.19032				structures/cc	B
CC1-L6-3CB-100204	Total Asbestos Structures	100	0.156	structure/cc	0.00156	0.126984	0.19032				structures/cc	B



TABLE 1B
DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document, "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," 2/94.

- U** The analyte was analyzed for, but was not detected above the level of the reported value. The reported value is either the sample quantitation limit or the sample detection limit.
- L** Indicates results which fall between the sample detection limit and the CRDL. Results are estimated and are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.
- J** The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.
- R** The data are unusable. The analyte was analyzed for, but the presence or absence of the analyte cannot be verified.
- UJ** A combination of the "U" and "J" qualifier. The analyte was analyzed for but was not detected. The reported value is an estimate and may be inaccurate or imprecise.

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Thursday, April 14, 2005

Lab/Cor Report Number: 041172R07

Howard Edwards
Ecology and Environment, Inc.
350 Sansome
Ste 300
San Francisco CA 94104

Phone: 415-981-2811
Fax: 415-981-0801

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT
Project Number: 0440.01CP-0001
Client Reference:
Sample Receipt Date: 10/7/2004

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Analysis #	Client Sample # and Description	Analysis Type and Notes
Batch #: B4760		
S1-A1	APG-L2-13CH-100404	ISO 13794, indirect: Rejected - overloaded
S2-A1	APG-L2-1CH-100404	ISO 13794, indirect: Rejected - overloaded
S11-A1	CC1-L6-3CB-100204	ISO 13794, indirect: Rejected - overloaded

ISO 13794, indirect Preparation and analysis of the above samples was conducted in accordance with the ISO method 13794 (Indirect) for the identification of asbestos. Briefly, a portion of the original filter was ashed and treated with acetic acid to isolate the material of interest. The samples were then aliquoted onto lab filters which were collapsed with acetone, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in acetone until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The redeposit samples were analyzed at various approximate screen magnifications of 5,000x for PCM equivalent structures, 10,000x for asbestos structures greater than 5.0 micrometer lengths, and 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed on the microscope at a magnification of approximately 550X.

Disclaimer This test report relates only to the items tested in this report. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor, Inc. the opportunity to provide you with analytical services.

Sincerely,



Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

John Harris, M.P.H.
Laboratory Director

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

ANALYSIS DETAIL

Lab/Cor Sample No.	B4760 S1 A1	Volume (L)	300.96
Client Sample No.	APG-L2-13CH-100404	No. of Grid Openings	177
Description		Filter Area (mm ²)	193
Analysis Date	2/7/2005	Area Analyzed (mm ²)	2.56
Analyst	KM	Analytical Sens. (struc/cc)	0.00100
		Detection Limit. (struc/cc)	0.00299

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	27.3	0.0700	0.0546 - 0.0885 (Poisson)	70
Total Asbestos Structures	27.3	0.0700	0.0546 - 0.0885 (Poisson)	70
Asbestos Structures > 5um	8.2	0.0210	0.0130 - 0.0321	21
Asbestos Fibers and Bundles > 5um	7.8	0.0200	0.0122 - 0.0309	20
PCM Equivalent Fibers-US	7.8	0.0200	0.0122 - 0.0309	20
PCM Equivalent Structures-US	7.4	0.0190	0.0114 - 0.0297	19
PROTOCOL ASB STRUCS 5-10	1.6	0.00400	0.00109 - 0.0102	4
PROTOCOL ASB STRUCS >10	0.4	0.00100	0.00 - 0.00474	1
PROTOCOL ASB STRUCS TOTAL	1.9	0.00500	0.00162 - 0.0117	5
PROTOCOL CHRYS STRUCS 5-10	0.8	0.00200	0.00 - 0.00630	2
PROTOCOL CHRYS STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS TOTAL	0.8	0.00200	0.00 - 0.00630	2
PROTOCOL AMPH STRUCS 5-10	0.8	0.00200	0.00 - 0.00630	2
PROTOCOL AMPH STRUCS >10	0.4	0.00100	0.00 - 0.00474	1
PROTOCOL AMPH STRUCS TOTAL	1.2	0.00300	0.00 - 0.00775	3
AHERA-like Total Structures 3:1	27.3	0.0700	0.0546 - 0.0885 (Poisson)	70
AHERA-like Asb Strucs >5 and 3:1	8.2	0.0210	0.0130 - 0.0321	21
AHERA-like Asb Strucs 5 - 10 and 3:1	5.8	0.0150	0.00840 - 0.0247	15
AHERA-like Asb Strucs >10 and 3:1	2.3	0.00600	0.00220 - 0.0131	6
Total Other Amphibole Strucs 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

ANALYSIS DETAIL

Lab/Cor Sample No. B4760 S2 A1

Volume (L) 296.04

Client Sample No. APG-L2-1CH-100404

No. of Grid Openings 180

Description

Filter Area (mm²) 193

Analysis Date 2/8/2005

Area Analyzed (mm²) 2.61

Analyst JH

Analytical Sens. (struc/cc) 0.00100

Detection Limit. (struc/cc) 0.00299

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Total Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Asbestos Structures > 5um	1.2	0.00300	0.00 - 0.00775	3
Asbestos Fibers and Bundles > 5um	0.8	0.00200	0.00 - 0.00630	2
PCM Equivalent Fibers-US	0.4	0.00100	0.00 - 0.00474	1
PCM Equivalent Structures-US	0.4	0.00100	0.00 - 0.00474	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
AHERA-like Total Structures 3:1	2.4	0.00600	0.0022 - 0.0131	6
AHERA-like Asb Strucs >5 and 3:1	0.8	0.00200	0.00 - 0.00630	2
AHERA-like Asb Strucs 5 - 10 and 3:1	0.4	0.00100	0.00 - 0.00474	1
AHERA-like Asb Strucs >10 and 3:1	0.4	0.00100	0.00 - 0.00474	1
Total Other Amphibole Strucs 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0

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A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

ANALYSIS DETAIL

Lab/Cor Sample No.	B4760 S2 A1	Volume (L)	296.04
Client Sample No.	APG-L2-1CH-100404	No. of Grid Openings	180
Description		Filter Area (mm ²)	193
Analysis Date	2/8/2005	Area Analyzed (mm ²)	2.61
Analyst	JH	Analytical Sens. (struc/cc)	0.00100
		Detection Limit. (struc/cc)	0.00299

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Total Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Asbestos Structures > 5um	1.2	0.00300	0.00 - 0.00775	3
Asbestos Fibers and Bundles > 5um	0.8	0.00200	0.00 - 0.00630	2
PCM Equivalent Fibers-US	0.4	0.00100	0.00 - 0.00474	1
PCM Equivalent Structures-US	0.4	0.00100	0.00 - 0.00474	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
AHERA-like Total Structures 3:1	2.4 27	0.00700	0.00281 - 0.0144	7
AHERA-like Asb Strucs >5 and 3:1	0.8 1.2 71C	0.00300	0.00 - 0.00775	3
AHERA-like Asb Strucs 5 - 10 and 3:1	0.4 0.8	0.00200	0.00 - 0.00630	2
AHERA-like Asb Strucs >10 and 3:1	0.4	0.00100	0.00 - 0.00474	1
Total Other Amphibole Strucs 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

ANALYSIS DETAIL

Lab/Cor Sample No.	B4760 S2 A1	Volume (L)	296.04
Client Sample No.	APG-L2-1CH-100404	No. of Grid Openings	180
Description		Filter Area (mm ²)	193
Analysis Date	2/8/2005	Area Analyzed (mm ²)	2.61
Analyst	JH	Analytical Sens. (struc/cc)	0.00100
		Detection Limit. (struc/cc)	0.00299

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Total Asbestos Structures	2.7	0.00700	0.00281 - 0.0144	7
Asbestos Structures > 5um	1.2	0.00300	0.00 - 0.00775	3
Asbestos Fibers and Bundles > 5um	0.8	0.00200	0.00 - 0.00630	2
PCM Equivalent Fibers-US	0.4	0.00100	0.00 - 0.00474	1
PCM Equivalent Structures-US	0.4	0.00100	0.00 - 0.00474	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS >10	0.0	<0.00299	0.00 - 0.00299	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.00299	0.00 - 0.00299	0
AHERA-like Total Structures 3:1	2.7	0.00700	0.00281 - 0.0144	X 6
AHERA-like Asb Strucs >5 and 3:1	1.2	0.00300	0.00 - 0.00775	3
AHERA-like Asb Strucs 5 - 10 and 3:1	0.8	0.00200	0.00 - 0.00630	2
AHERA-like Asb Strucs >10 and 3:1	0.4	0.00100	0.00 - 0.00474	1
Total Other Amphibole Strucs 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.00299	0.00 - 0.00299	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

ANALYSIS DETAIL

Lab/Cor Sample No.	B4760 S11 A1	Volume (L)	608.15
Client Sample No.	CC1-L6-3CB-100204	No. of Grid Openings	56
Description		Filter Area (mm²)	193
Analysis Date	2/8/2005	Area Analyzed (mm²)	0.811
Analyst	KM	Analytical Sens. (struc/cc)	0.00156
		Detection Limit. (struc/cc)	0.00468

Structure Type	Filter Density (s/mm²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	123.2	0.156	0.127 - 0.190 (Poisson)	100
Total Asbestos Structures	123.2	0.156	0.127 - 0.190 (Poisson)	100
Asbestos Structures > 5um	23.4	0.0297	0.0179 - 0.0464	19
Asbestos Fibers and Bundles >5um	16.0	0.0203	0.0108 - 0.0348	13
PCM Equivalent Fibers-US	17.3	0.0219	0.0120 - 0.0367	14
PCM Equivalent Structures-US	13.6	0.0172	0.00859 - 0.0308	11
PROTOCOL ASB STRUCS 5-10	1.2	0.00156	0.00 - 0.00742	1
PROTOCOL ASB STRUCS >10	0.0	<0.00468	0.00 - 0.00468	0
PROTOCOL ASB STRUCS TOTAL	1.2	0.00156	0.00 - 0.00742	1
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.00468	0.00 - 0.00468	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.00468	0.00 - 0.00468	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.00468	0.00 - 0.00468	0
PROTOCOL AMPH STRUCS 5-10	1.2	0.00156	0.00 - 0.00742	1
PROTOCOL AMPH STRUCS >10	0.0	<0.00468	0.00 - 0.00468	0
PROTOCOL AMPH STRUCS TOTAL	1.2	0.00156	0.00 - 0.00742	1
AHERA-like Total Structures 3:1	123.2	0.156	0.127 - 0.190 (Poisson)	100
AHERA-like Asb Strucs >5 and 3:1	23.4	0.0297	0.0179 - 0.0464	19
AHERA-like Asb Strucs 5 - 10 and 3:1	13.6	0.0172	0.00859 - 0.0308	11
AHERA-like Asb Strucs >10 and 3:1	9.9	0.0125	0.00540 - 0.0247	8
Total Other Amphibole Strucs 3:1	0.0	<0.00468	0.00 - 0.00468	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.00468	0.00 - 0.00468	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.00468	0.00 - 0.00468	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.00468	0.00 - 0.00468	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Description:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	C43				NSD							
A	2	C41	AZQ	1		MD1-0	4	3.5	1.1			Actinolite	TAS_AHRA
A	2	C41	AZQ		1	MF	2	0.5	4.0			Mg, Si, Ca, Fe Actinolite	
A	3	D40	AQ	2	2	F	1.1	0.3	3.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	4	D42	AQ	3	3	F	3.7	0.65	5.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	5	D44				NSD							
A	6	D33				NSD							
A	7	D31				NSD							
A	8	C30	AZQ	4	4	F	4.75	0.85	5.6	1344	1005	Mg, Si, Ca, Fe Actinolite Zone Axis [1 0 0] - KM	TAS_AHRA
A	9	C34				NSD							
A	10	C23				NSD							
A	11	D20	AQ	5	5	F	4.3	0.25	17			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	12	D22				NSD							
A	13	D24	AQ	6	6	F	10.7	2.5	4.3			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
A	14	D13				NSD							
A	15	D11	AQ	7	7	F	1.6	0.5	3.2			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	16	C10	AQ	8	8	F	1.7	0.4	4.2			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
A	17	C12	AQ	9	9	F	1.65	0.5	3.3			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	18	C14				NSD							
A	19	C1				NSD							
A	20	D2	AQ	10	10	F	3.5	0.8	4.4			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
A	21	D4	AQ	11	11	F	7.5	1.2	6.2			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	22	A3	AQ	12	12	F	6.5	1.5	4.3			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	23	A1				NSD							
A	24	B2	AQ	13	13	F	12.8	1.75	7.3			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
A	25	B4				NSD							
A	26	B13	AQ	14	14	F	8.4	1.25	6.7			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Description:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	26	B13	AQ	15	15	F	5.6	0.3	19			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, PSAS 5-10, PSAS TOT, PSAM 5-10, PSAM TOT, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	27	B11			NSD								
A	28	A10			NSD								
A	29	A12			NSD								
A	30	A14	AQ	16	16	F	4.25	1.2	3.5			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	31	B11			NSD								
B	32	A10			NSD								
B	33	A12			NSD								
B	34	A14			NSD								
B	35	C44			NSD								
B	36	C42			NSD								
B	37	C40			NSD								
B	38	D41			NSD								
B	39	D43			NSD								
B	40	D34	AQ	17	17	F	4.7	1.4	3.4			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	41	D32			NSD								
B	42	D30			NSD								
B	43	C31	AQ	18	18	F	4.5	0.75	6.0			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	43	C31	AQ	19	19	F	2.7	0.65	4.2			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	44	C33			NSD								
B	45	A24	CDQ	20	20	B	1.8	0.12	15	53	15757	Mg, Si Chrysotile Verified - KM	TAS_AHRA
B	46	A4			NSD								
B	47	D14			NSD								
B	48	D44			NSD								
B	49	D33			NSD								
B	50	D13			NSD								
B	51	A3			NSD								
B	52	A23			NSD								
B	53	A43			NSD								
B	54	B42	AQ	21		MD1-0	4	2.5	1.6			Actinolite	TAS_AHRA
B	54	B42	AQ		21	MF	3.2	0.45	7.1			Mg, Si, Ca, Fe Actinolite	

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Report # 041172R07

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TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Description:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	55	B22	CD	22	22	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	55	B22	CD	23	23	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	56	B2	AQ	24	24	F	2.2	0.35	6.3			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	57	C12	AQ	25	25	F	8.2	1.8	4.6			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	58	C32	AQ	26	26	F	4.8	1.2	4.0			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	59	B11			NSD								
B	60	C1			NSD								
C	61	B34			NSD								
C	62	B14			NSD								
C	63	C4			NSD								
C	64	C23			NSD								
C	65	C13			NSD								
C	66	B3			NSD								
C	67	B23			NSD								
C	68	B43			NSD								
C	69	B32			NSD								
C	70	B12			NSD								
C	71	C2	AQ	27	27	F	7.5	1.5	5.0			Mg, Al, Si, Ca, Fe Actinolite Ferrianactinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
C	72	C22			NSD								
C	73	C42			NSD								
C	74	C31			NSD								
C	75	C11			NSD								
C	76	B1	AQ	28	28	F	8.5	2	4.2			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
C	77	B21			NSD								
C	78	B41	CD	29	29	F	2	0.1	20			Chrysotile	TAS_AHRA
C	79	A31			NSD								
C	80	A11	CD	30	30	F	0.9	0.12	7.5			Chrysotile	TAS_AHRA
C	81	D1	CD	31	31	B	2.5	0.15	17			Chrysotile	TAS_AHRA
C	82	D41	CD	32	32	F	1.3	0.12	11			Chrysotile	TAS_AHRA
C	83	D21			NSD								

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Descriptiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
C	84	D32	CD	33	33	F	1.2	0.11	11			Chrysotile	TAS_AHRA
C	84	D32	AQ	34	34	F	4	0.6	6.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
C	85	D12	AQ	35	35	F	2.7	0.6	4.5			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
C	86	A2		NSD									
C	87	A22		NSD									
C	88	A42		NSD									
C	89	A43	AQ	36	36	F	2.1	0.6	3.5			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
C	90	A23		NSD									
C	91	A3		NSD									
C	92	D13		NSD									
C	93	D43	AQ	37		MD1-0	3.2	2	1.6			Actinolite	TAS_AHRA
C	93	D43	AQ		37	MF	2	0.35	5.7			Mg, Al, Si, Ca, Fe Actinolite	
C	94	D33		NSD									
C	95	C40		NSD									
C	96	C20		NSD									
C	97	D10	CD	38	38	B	2.2	0.5	4.4			Mg, Al, Si, Ca, Fe Chrysotile	TAS_AHRA
C	98	D30		NSD									
C	99	A10	CD	39	39	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
C	99	A10	CDQ	40	40	F	2.5	0.11	23			Mg, Si Chrysotile	TAS_AHRA
C	99	A10	CD	41	41	F	0.8	0.08	10			Chrysotile	TAS_AHRA
C	100	A30	CD	42	42	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA
D	101	B44		NSD									
D	102	B24	AQ	43	43	F	3.2	0.5	6.4			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
D	103	B4		NSD									
D	104	C14	AQ	44	44	F	3	0.8	3.8			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
D	105	C34	AQ	45	45	F	13	0.4	32			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, PSAS >10, PSAS TOT, PSAM >10, PSAM TOT, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
D	106	C43	CD	46	46	B	5.3	0.35	15			Chrysotile	AS>5, AFB>5, PCMEF-US, PCMES-US, PSAS 5-10, PSAS TOT, PCAS 5-10, PCAS TOT, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
D	106	C43	CD	47	47	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
D	107	C23		NSD									

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TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Description:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
D	108	C3											
D	109	B13											
D	110	B33											
D	111	B42											
D	112	B22											
D	113	B2											
D	114	C12											
D	115	C32											
D	116	C41	CD	48		MD1-0	5	2.5	2.0			Chrysotile	TAS_AHRA
D	116	C41	CD		48	MF	1.5	0.1	15			Chrysotile	
D	117	C21				NSD							
D	118	C1				NSD							
D	119	B11	AQ	49	49	F	6.5	0.4	16			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, PSAS 5-10, PSAS TOT, PSAM 5-10, PSAM TOT, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
D	120	B31				NSD							
D	121	B40				NSD							
D	122	B20				NSD							
D	123	A10	AQ	50	50	F	7	0.8	8.8			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
D	124	A30				NSD							
D	125	A41				NSD							
D	126	A31				NSD							
D	127	A21				NSD							
D	128	A11	AQ	51		MD1-0	9	6	1.5			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
D	128	A11	AQ		51	MF	3.8	0.45	8.4			Mg, Al, Si, Ca, Fe Actinolite	
D	129	A1				NSD							
D	130	D1				NSD							
D	131	D11				NSD							
D	132	D21				NSD							
D	133	D31	AQ	52	52	F	5	1.5	3.3			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
D	134	D41				NSD							
D	135	D40				NSD							

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Report # 041172R07

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TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
D	136	D20			NSD								
D	137	D10			NSD								
D	138	C10			NSD								
D	139	C20			NSD								
D	140	C30	AQ	53	53	F	12	2	6.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
E	141	B24			NSD								
E	142	B4			NSD								
E	143	C4			NSD								
E	144	C24			NSD								
E	145	C44			NSD								
E	146	C43	AQ	54	54	F	1.8	0.5	3.6			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	146	C43	AQ	55	55	F	3.2	0.25	13			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	147	C33			NSD								
E	148	C23			NSD								
E	149	C3	AQ	56	56	F	5.8	1.5	3.9			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
E	150	B13			NSD								
E	151	B12			NSD								
E	152	B2			NSD								
E	153	C12			NSD								
E	154	C32	CD	57	57	F	1.5	0.11	14			Chrysotile	TAS_AHRA
E	155	C42			NSD								
E	156	C41			NSD								
E	157	C21	AQ	58	58	F	1.8	0.5	3.6			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	158	C11			NSD								
E	159	B1			NSD								
E	160	B11	AQ	59	59	F	1.8	0.12	15			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	160	B11	AQ	60	60	F	5.3	0.65	8.2			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
E	161	B10			NSD								
E	162	A20	CD	61	61	F	0.9	0.1	9.0			Chrysotile	TAS_AHRA
E	163	A10			NSD								

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-13CH-100404

Lab/Cor Sample No.: B4760 S1 A1

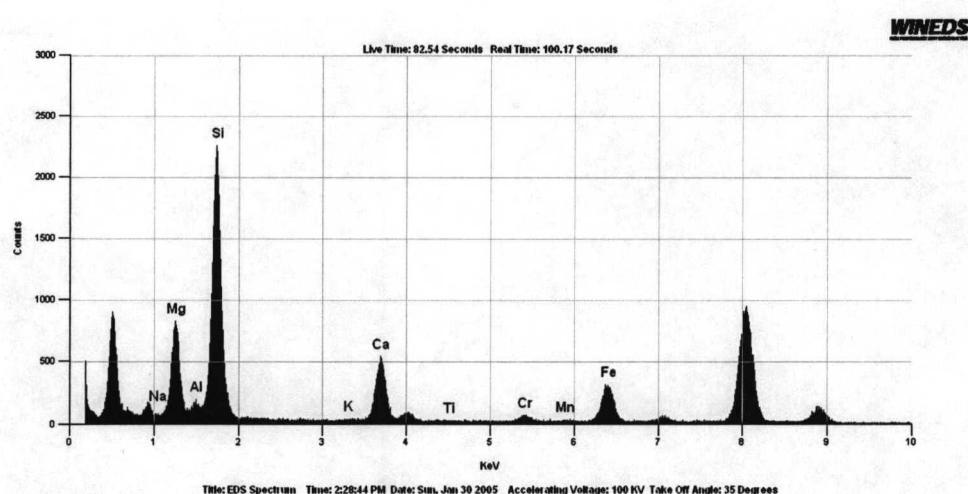
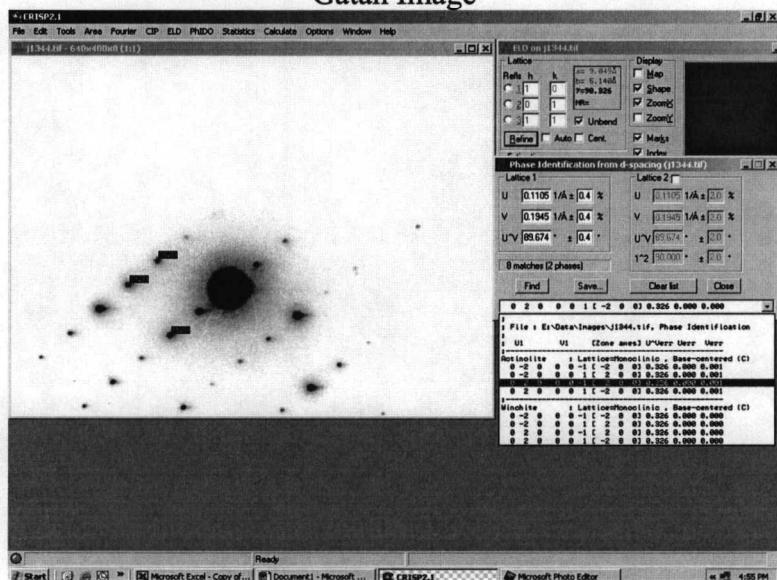
Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
E	164	A41	CD	62	62	F	1.2	0.1	12			Chrysotile	TAS_AHRA
E	165	A21			NSD								
E	166	A1			NSD								
E	167	D11	AQ	63	63	F	3	0.5	6.0			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	168	D31	CD	64	64	B	8	0.5	16			Chrysotile	AS>5, AFB>5, PCMEF-US, PCMES-US, PSAS 5-10, PSAS TOT, PCAS 5-10, PCAS TOT, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
E	168	D31	AQ	65	65	F	9	1.5	6.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
E	169	D32	CD	66	66	F	0.8	0.08	10			Chrysotile	TAS_AHRA
E	170	D22	AQ	67		MD1-1	21	4	5.2			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
E	170	D22	AQ		67	MF	20	1.2	17			Mg, Al, Si, Ca, Fe Actinolite	AFB>5, PCMEF-US
E	171	D2			NSD								
E	172	A2			NSD								
E	173	A12	AQ	68	68	F	2.5	0.8	3.1			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	173	A12	AQ	69	69	F	12-	2	6.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
E	174	A32	AQ	70	70	F	3	0.45	6.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	175	A22			NSD								
E	176	A42			NSD								
E	177	D41			NSD								

ACTINOLITE - Zone Axis [1 0 0]

041172-01 Neg# J1344

Gatan Image



Quantitative Analysis Results - Standardless Analysis :

041172-01 SP 1005 Sun, Jan 30 2005

EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 193.79

Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	8.33	MgO	15.41	0.36	15.41
Al	0.37	Al ₂ O ₃	0.87	0.15	0.87
Si	21.63	SiO ₂	59.66	0.85	59.66
Ca	4.56	CaO	11.73	0.41	11.73
Fe	3.37	Fe ₂ O ₃	12.33	0.62	12.33
<Total>	100.00		100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	59.66	Si+4	8.0000	8.0000							
Al ₂ O ₃	0.87	Al+3	0.1684	0.0000	0.1684						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.33	Fe+3	0.0300			0.0300	0.0000				
MgO	15.41	Mg+2	3.2372			3.2372	0.0000				
MnO	0	Fe+2	1.4463			1.4463	0.0000				
CaO	11.73	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.7825					1.7825	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	0.0000
Total	100		Excess	T site	0.1684	C site	0.0000	B site	0	A site	0

		Total	8	4.8820	1.7825	0.0000	0.0000
Prefix	none	%Fill	100	97.6393	89.1255		
Name	actinolite						
Modifier	none						
Group	Calcic Amphibole						

Sample # 041172-01-1005

Values	Satisfied Conditions
(Ca,Na)@B	1.78 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.78 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.69 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

Lab/Cor Sample No.: B4760 S2 A1

Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A34				NSD							
A	2	A14				NSD							
A	3	D4				NSD							
A	4	D24				NSD							
A	5	D44				NSD							
A	6	D42				NSD							
A	7	D22				NSD							
A	8	D2				NSD							
A	9	A12				NSD							
A	10	A32				NSD							
A	11	A42				NSD							
A	12	A40				NSD							
A	13	A20				NSD							
A	14	A10				NSD							
A	15	D10				NSD							
A	16	D30				NSD							
A	17	D40				NSD							
A	18	C41				NSD							
A	19	C21				NSD							
A	20	C1				NSD							
A	21	B11				NSD							
A	22	B31				NSD							
A	23	B41				NSD							
A	24	B43				NSD							
A	25	B23				NSD							
A	26	B3				NSD							
A	27	C13				NSD							
A	28	C33				NSD							
A	29	C43				NSD							
A	30	C24				NSD							
B	31	C44				NSD							
B	32	C42				NSD							
B	33	C40				NSD							
B	34	D41				NSD							

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

Lab/Cor Sample No.: B4760 S2 A1

Descriptiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	35	D43				NSD							
B	36	D34				NSD							
B	37	D32				NSD							
B	38	D30				NSD							
B	39	C31				NSD							
B	40	C33				NSD							
B	41	C24				NSD							
B	42	C22				NSD							
B	43	C20				NSD							
B	44	D21				NSD							
B	45	D23				NSD							
B	46	D14				NSD							
B	47	D12				NSD							
B	48	D10				NSD							
B	49	C11				NSD							
B	50	C13				NSD							
B	51	C4				NSD							
B	52	C2				NSD							
B	53	D1				NSD							
B	54	D3				NSD							
B	55	A4				NSD							
B	56	A2				NSD							
B	57	B1				NSD							
B	58	B3				NSD							
B	59	B14				NSD							
B	60	B12				NSD							
C	61	C44				NSD							
C	62	C42				NSD							
C	63	C40				NSD							
C	64	D41				NSD							
C	65	D43				NSD							
C	66	D34				NSD							
C	67	D32				NSD							
C	68	D30				NSD							

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

Lab/Cor Sample No.: B4760 S2 A1

Descripiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
C	69	C31				NSD							
C	70	C33				NSD							
C	71	C24				NSD							
C	72	C22				NSD							
C	73	C20				NSD							
C	74	D21				NSD							
C	75	D23				NSD							
C	76	D14				NSD							
C	77	D12				NSD							
C	78	D10				NSD							
C	79	C11				NSD							
C	80	C13				NSD							
C	81	C4				NSD							
C	82	C2				NSD							
C	83	D1				NSD							
C	84	D3				NSD							
C	85	A4				NSD							
C	86	A2				NSD							
C	87	B1				NSD							
C	88	B3				NSD							
C	89	B14				NSD							
C	90	B12				NSD							
D	91	A34				NSD							
D	92	A14				NSD							
D	93	D4				NSD							
D	94	D34				NSD							
D	95	D42				NSD							
D	96	D22				NSD							
D	97	D2				NSD							
D	98	A12				NSD							
D	99	A32				NSD							
D	100	A42				NSD							
D	101	A40				NSD							

Lab/Cor, Inc.
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Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

Lab/Cor Sample No.: B4760 S2 A1

Descripiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
D	102	A20	CDQ	1	1	F	1.4	0.08	18	1373	1033	Mg, Si Chrysotile Verified - KM	TAS_AHRA
D	103	A10				NSD							
D	104	D10				NSD							
D	105	D20				NSD							
D	106	D40				NSD							
D	107	C41				NSD							
D	108	C21				NSD							
D	109	B1				NSD							
D	110	B21				NSD							
D	111	B41				NSD							
D	112	B33				NSD							
D	113	B13				NSD							
D	114	C3				NSD							
D	115	C13				NSD							
D	116	C34				NSD							
D	117	B14				NSD							
D	118	B24				NSD							
D	119	B34				NSD							
D	120	B44				NSD							
E	121	A34				NSD							
E	122	A14				NSD							
E	123	D4	CDQ	2	2	B	8	4	2.0			Mg, Si Chrysotile	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
E	124	D24				NSD							
E	125	D44				NSD							
E	126	D42				NSD							
E	127	D22				NSD							
E	128	D2				NSD							
E	129	A12				NSD							
E	130	A32				NSD							
E	131	A42				NSD							
E	132	A40				NSD							
E	133	A20				NSD							
E	134	A10				NSD							

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

Lab/Cor Sample No.: B4760 S2 A1

Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
E	135	D10				NSD							
E	136	D30				NSD							
E	137	D40	AZQ	3	3	F	2.5	0.5	5.0	1379	1036	Mg, Al, Si, Ca, Fe Actinolite Ferrianactinolite - Zone Axis [3 3 2] - JH	TAS_AHRA
E	137	D40	AQ	4	4	F	2.2	0.7	3.1			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
E	138	C41				NSD							
E	139	C21				NSD							
E	140	C1				NSD							
E	141	B11				NSD							
E	142	B31				NSD							
E	143	B41				NSD							
E	144	B43				NSD							
E	145	B23				NSD							
E	146	B3				NSD							
E	147	C13				NSD							
E	148	C33				NSD							
E	149	C43				NSD							
E	150	C24				NSD							
F	151	D40				NSD							
F	152	A42	AQ	5	5	F	10	2	5.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
F	152	A42	AQ	6	6	F	1.5	0.22	6.8			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
F	153	A22				NSD							
F	154	A2				NSD							
F	155	D12				NSD							
F	156	D32				NSD							
F	157	D41				NSD							
F	158	D21				NSD							
F	159	D1				NSD							
F	160	A11				NSD							
F	161	A31				NSD							
F	162	A40				NSD							
F	163	A20				NSD							
F	164	A10				NSD							

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

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Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: APG-L2-1CH-100404

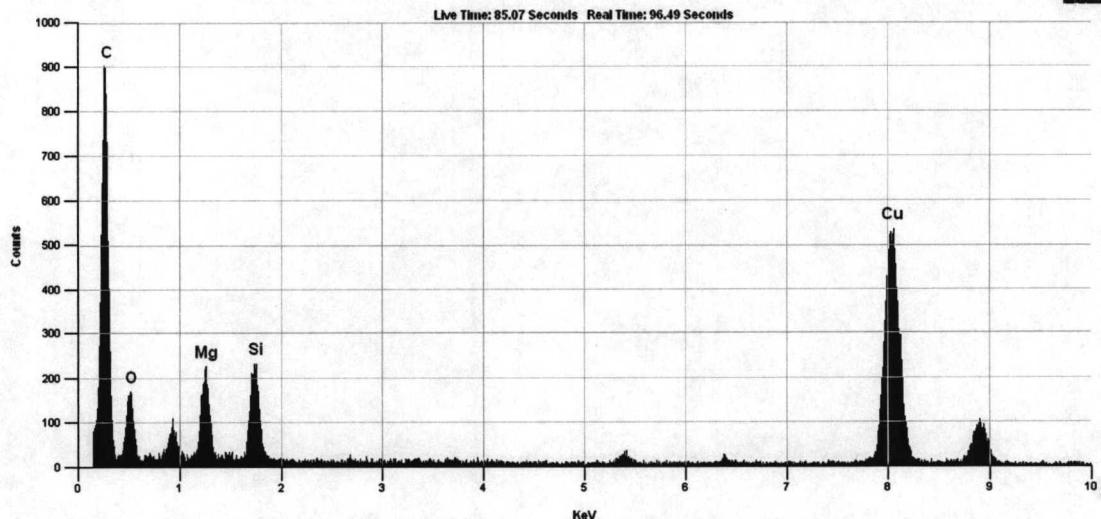
Lab/Cor Sample No.: B4760 S2 A1

Descripiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
F	165	B10				NSD							
F	166	B30				NSD							
F	167	B41				NSD							
F	168	B21				NSD							
F	169	B1				NSD							
F	170	C11				NSD							
F	171	C31				NSD							
F	172	C42	AQ	7	7	F	11	3.6	3.1			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
F	173	C22				NSD							
F	174	C2				NSD							
F	175	B12				NSD							
F	176	B32				NSD							
F	177	B43				NSD							
F	178	B23				NSD							
F	179	B3				NSD							
F	180	C13				NSD							

Chrysotile Image
041172-02 Neg#J1373
Gatan Image

WINEDS



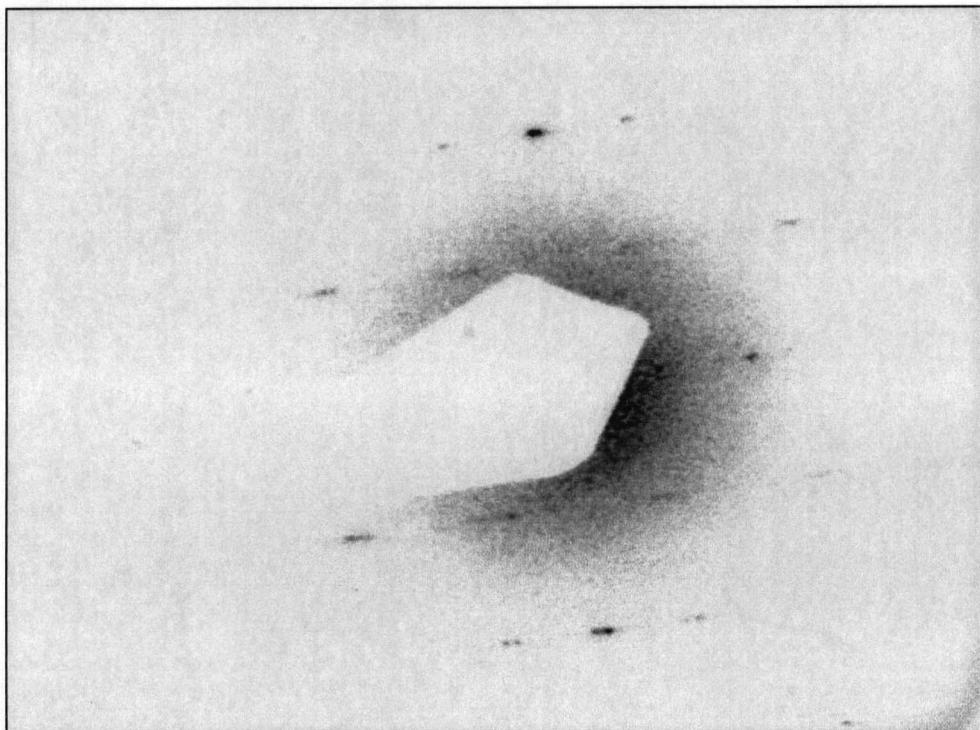
Title: 041172-02-1033 Time: 10:35:54 AM Date: Wed, Feb 09 2005 Accelerating Voltage: 100 KV Take Off Angle: 35 Degrees

Quantitative Analysis Results - Standardless Analysis :

041172-02-1033 Wed, Feb 09 2005

EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 5.34
Correction: CLIFF LORIMER, Cycles: 1

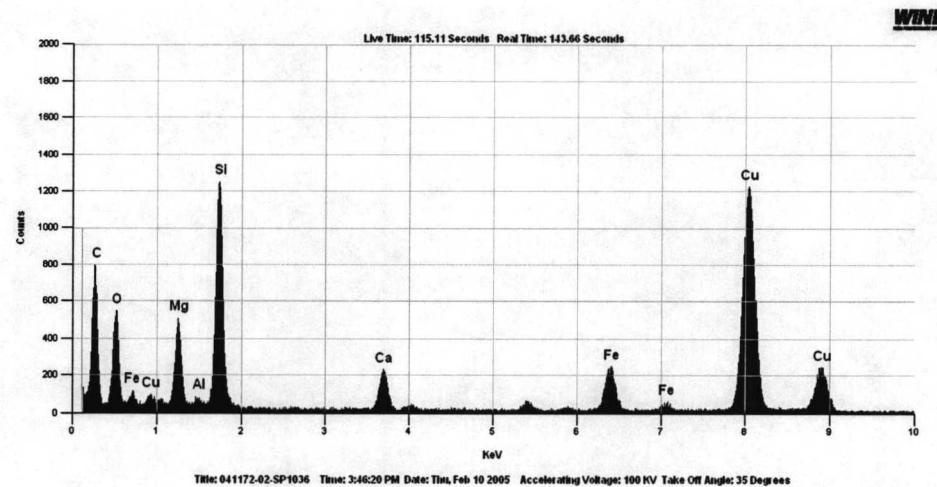
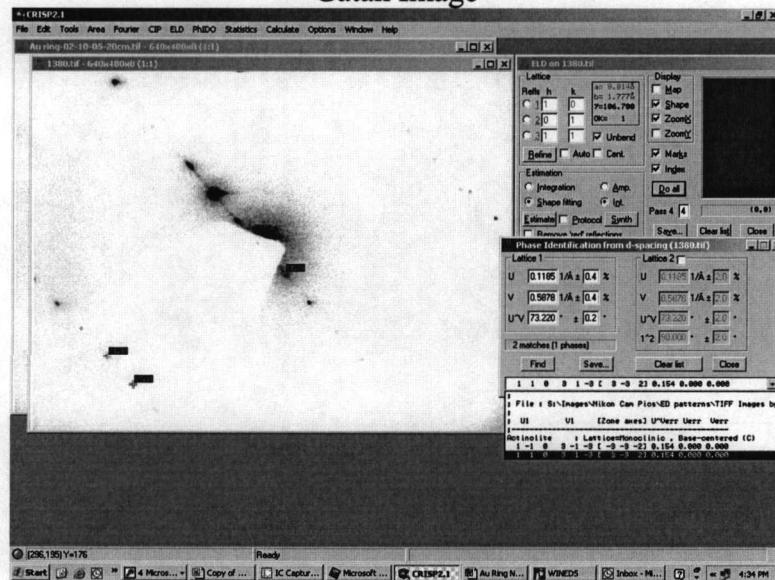
Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	19.76	MgO	39.67	3.12	39.67
Si	20.16	SiO ₂	60.33	4.68	60.33
<Total>	100.00		100.00		100.00



ACTINOLITE - Zone Axis [3 3 2]

041172-02 Neg# J1379

Gatan Image



Quantitative Analysis Results - Standardless Analysis : 041172-02-SP1036 Thu, Feb 10 2005

EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 76.20
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	8.35	MgO	15.30	0.66	15.30
Al	0.23	Al ₂ O ₃	0.53	0.21	0.53
Si	21.42	SiO ₂	58.54	1.50	58.54
Ca	3.30	CaO	8.43	0.68	8.43
Fe	4.74	Fe ₂ O ₃	17.21	1.56	17.21
<Total>		100.00	100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	58.54	Si+4	8.0000	8.0000							
Al ₂ O ₃	0.53	Al+3	0.0951	0.0000	0.0951						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	17.21	Fe+3	0.8811			0.8811	0.0000				
MgO	15.3	Mg+2	3.1695			3.1695	0.0000				
MnO	0	Fe+2	1.0253			0.8542	0.1711				
CaO	8.43	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.2623					1.2623	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	100.01		Excess	T site	0.0951	C site	0.1711	B site	0	A site	0

		Total	8	5.0000		1.2623		0.0000	0.0000
Prefix	none	%Fill	100	100		63.1138			
Name	probable actinolite Ca values below optimal levels								
Modifier	Ferrian								
Group	Calcic Amphibole								

Sample # 041172-02-1379

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.26 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 1 < Ca@B < 1.5 and (Na,K)@A < 0.5
Ca@B	1.26 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.76 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: CC1-L6-3CB-100204

Lab/Cor Sample No.: B4760 S11 A1

Descriptiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B34	CDQ	1	1	F	2	0.1	20	56	15758	Mg, Si Chrysotile Verified - KM	TAS_AHRA
A	2	B14			NSD								
A	3	C4	AQ	2	2	F	7.5	1.8	4.2			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	3	C4	AZQ	3		MD1-0	5	4	1.2			Actinolite	TAS_AHRA
A	3	C4	AZQ		3	MF	4.5	0.4	11	57	15759	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [1 0 1] - KM	
A	3	C4	CD	4	4	F	0.7	0.08	8.8			Chrysotile	TAS_AHRA
A	4	C24			NSD								
A	5	C44	AQ	5	5	F	4.5	1.2	3.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	5	C44	AQ	6	6	F	7.8	1.2	6.5			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	6	C33	CD	7		MD1-0	5.8	4	1.5			Chrysotile	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	6	C33	CD		7	MF	2	0.1	20			Chrysotile	
A	7	C13	CD	8	8	F	3	0.1	30			Chrysotile	TAS_AHRA
A	7	C13	CD	9	9	F	2	0.08	25			Chrysotile	TAS_AHRA
A	8	B3			NSD								
A	9	B23	CD	10	10	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
A	9	B23	CD	11	11	F	1	0.1	10			Chrysotile	TAS_AHRA
A	10	B43	CD	12		MD1-0	3.5	1.2	2.9			Chrysotile	TAS_AHRA
A	10	B43	CD		12	MF	1.8	0.1	18			Chrysotile	
A	10	B43	CD	13	13	F	1	0.1	10			Chrysotile	TAS_AHRA
A	11	B32			NSD								
A	12	B12	AQ	14		MD1-0	5	3	1.7			Actinolite	TAS_AHRA
A	12	B12	AQ		14	MF	3	0.5	6.0			Mg, Al, Si, Ca, Fe Actinolite	
A	12	B12	AQ	15	15	F	4	0.5	8.0			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	13	C2	AQ	16	16	B	20	5	4.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	13	C2	AQ	17		MD1-1	8	5	1.6			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	13	C2	AQ		17	MF	7	0.7	10			Actinolite	AFB>5, PCMEF-US
A	14	C22	CD	18		MD1-0	1.5	0.5	3.0			Chrysotile	TAS_AHRA
A	14	C22	CD		18	MF	1.2	0.08	15			Chrysotile	
A	14	C22	CD	19	19	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: CC1-L6-3CB-100204

Lab/Cor Sample No.: B4760 S11 A1

Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	15	C42	AQ	20	20	F	3.7	0.45	8.2			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	16	C31			NSD								
A	17	C11	CD	21	21	F	0.5	0.1	5.0			Chrysotile	TAS_AHRA
A	17	C11	CD	22		MD1-0	1.8	0.7	2.6			Chrysotile	TAS_AHRA
A	17	C11	CD		22	MF	0.8	0.08	10			Chrysotile	
A	18	B1	AQ	23	23	F	1.8	0.15	12			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	19	B21			NSD								
A	20	B41	CDQ	24	24	F	0.7	0.08	8.8			Chrysotile	TAS_AHRA
A	21	A31	CD	25	25	F	0.8	0.08	10			Chrysotile	TAS_AHRA
A	21	A31	AQ	26	26	F	3.7	0.7	5.3			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	21	A31	AQ	27	27	F	2.7	0.5	5.4			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	21	A31	AQ	28	28	F	3.3	0.6	5.5			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	21	A31	AQ	29	29	F	2.8	0.6	4.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	22	A11	CD	30	30	F	0.8	0.08	10			Chrysotile	TAS_AHRA
A	22	A11	CD	31		MD1-0	7.5	2.5	3.0			Chrysotile	AS>5, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	22	A11	CD		31	MF	1	0.1	10			Chrysotile	
A	23	D1	CD	32	32	F	1.5	0.08	19			Chrysotile	TAS_AHRA
A	24	D21	CD	33	33	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA
A	25	D41			NSD								
A	26	D32	CD	34	34	F	1.1	0.11	10			Chrysotile	TAS_AHRA
A	26	D32	CD	35	35	F	0.5	0.1	5.0			Chrysotile	TAS_AHRA
A	27	D12	CD	36	36	F	1.2	0.12	10			Chrysotile	TAS_AHRA
A	27	D12	AQ	37	37	F	6	1.5	4.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	28	A2			NSD								
A	29	A22	CD	38	38	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
A	29	A22	CD	39	39	F	1.2	0.1	12			Chrysotile	TAS_AHRA
A	30	A42			NSD								
B	31	A34	AQ	40	40	F	4	1.3	3.1			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	31	A34	CD	41	41	F	0.6	0.1	6.0			Chrysotile	TAS_AHRA
B	31	A34	AQ	42	42	F	10.2	1.7	6.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: CC1-L6-3CB-100204

Lab/Cor Sample No.: B4760 S11 A1

Descriptiton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	31	A34	CD	43	43	F	1	0.08	12			Chrysotile	TAS_AHRA
B	32	A14	CD	44		MD1-0	1.5	0.8	1.9			Chrysotile	TAS_AHRA
B	32	A14	CD		44	MF	0.8	0.08	10			Chrysotile	
B	32	A14	CD	45	45	F	1.2	0.1	12			Chrysotile	TAS_AHRA
B	32	A14	CD	46	46	F	2.6	0.1	26			Chrysotile	TAS_AHRA
B	32	A14	CD	47	47	F	0.8	0.08	10			Chrysotile	TAS_AHRA
B	33	D4	CD	48		MD1-0	4.5	2.5	1.8			Chrysotile	TAS_AHRA
B	33	D4	CD		48	MF	1.2	0.1	12			Chrysotile	
B	34	D24		NSD									
B	35	D44		NSD									
B	36	D33		NSD									
B	37	D13	CD	49	49	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA
B	37	D13	AQ	50	50	F	3.2	0.7	4.6			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	37	D13	CD	51	51	F	0.8	0.08	10			Chrysotile	TAS_AHRA
B	37	D13	CD	52	52	F	2	0.11	18			Chrysotile	TAS_AHRA
B	37	D13	CD	53	53	F	1.5	0.11	14			Chrysotile	TAS_AHRA
B	38	A13	CD	54		MD1-0	6	3	2.0			Chrysotile	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	38	A13	CD		54	MF	2	0.1	20			Chrysotile	
B	38	A13	AQ	55	55	B	6.5	2.5	2.6			Mg, Al, Si, Ca, Fe Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	38	A13	CD	56		MD1-0	3.8	1.5	2.5			Chrysotile	TAS_AHRA
B	38	A13	CD		56	MF	1.8	0.08	22			Chrysotile	
B	39	A23	CD	57	57	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	39	A23	AQ	58	58	F	1.8	0.45	4.0			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	39	A23	CD	59	59	F	2	0.12	17			Chrysotile	TAS_AHRA
B	40	A33	CD	60	60	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA
B	40	A33	AQ	61	61	B	12.5	3	4.2			Mg, Al, Si, Ca, Fe Actinolite	AS>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	41	A32		NSD									
B	42	A12	AQ	62	62	F	4	0.6	6.7			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	42	A12	CD	63	63	F	1	0.08	12			Chrysotile	TAS_AHRA
B	42	A12	CD	64	64	F	1.8	0.11	16			Chrysotile	TAS_AHRA
B	43	D2		NSD									
B	44	D22	CD	65		MD1-0	1.8	0.8	2.2			Chrysotile	TAS_AHRA

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: CC1-L6-3CB-100204

Lab/Cor Sample No.: B4760 S11 A1

Description:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	44	D22	CD		65	MF	1.2	0.1	12			Chrysotile	
B	44	D22	AQ	66	66	F	16	2	8.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	45	D42	AQ	67	67	F	12	1.5	8.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	45	D42	CD	68	68	F	0.8	0.08	10			Chrysotile	TAS_AHRA
B	45	D42	AQ	69	69	F	1.8	0.2	9.0			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	46	D31	AQ	70	70	F	2.8	0.45	6.2			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	47	D1	AQ	71		MD1-1	14	8	1.8			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	47	D1	AQ		71	MF	7.2	0.8	9.0			Mg, Al, Si, Ca, Fe Actinolite	AFB>5, PCMEF-US
B	47	D1	CD	72	72	F	0.6	0.08	7.5			Chrysotile	TAS_AHRA
B	48	A11	CD	73	73	F	0.6	0.1	6.0			Chrysotile	TAS_AHRA
B	48	A11	AQ	74	74	F	3.2	0.25	13			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	48	A11	CD	75		MD1-0	2.5	1.2	2.1			Chrysotile	TAS_AHRA
B	48	A11	CD		75	MF	2	0.06	33			Chrysotile	
B	49	A21	CD	76	76	F	0.6	0.1	6.0			Chrysotile	TAS_AHRA
B	49	A21	CD	77	77	F	4.2	0.08	52			Chrysotile	TAS_AHRA
B	50	A31	CD	78	78	F	1.2	0.2	6.0			Chrysotile	TAS_AHRA
B	50	A31	CD	79	79	F	1.2	0.08	15			Chrysotile	TAS_AHRA
B	51	C41	CD	80	80	F	1.2	0.11	11			Chrysotile	TAS_AHRA
B	52	C31	AQ	81		MD1-1	8	5	1.6			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS>5-10_AHRA
B	52	C31	AQ		81	MF	5.5	0.45	12			Mg, Al, Si, Ca, Fe Actinolite	AFB>5, PCMEF-US, PSAS 5-10, PSAS TOT, PSAM 5-10, PSAM TOT
B	53	C21	CD	82	82	F	0.6	0.08	7.5			Chrysotile	TAS_AHRA
B	53	C21	CD	83	83	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	53	C21	AQ	84	84	F	17	3	5.7			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	53	C21	CD	85	85	F	1	0.08	12			Chrysotile	TAS_AHRA
B	53	C21	CD	86	86	F	0.7	0.1	7.0			Chrysotile	TAS_AHRA
B	54	C1	CD	87	87	F	1.2	0.08	15			Chrysotile	TAS_AHRA
B	54	C1	CD	88	88	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	54	C1	CD	89		MD1-0	1.8	0.6	3.0			Chrysotile	TAS_AHRA

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 041172R07

Client: Ecology and Environment, Inc.

Project Name: Site# 0440.01CP, 0440.01CP-0001 - FINAL REPORT

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: CC1-L6-3CB-100204

Lab/Cor Sample No.: B4760 S11 A1

Descripton:

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	54	C1	CD		89	MF	0.8	0.1	8.0			Chrysotile	
B	54	C1	AQ	90	90	F	7.8	2	3.9			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	54	C1	CD	91	91	F	1.2	0.11	11			Chrysotile	TAS_AHRA
B	54	C1	AQ	92	92	F	8	1	8.0			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	55	B1	CD	93	93	F	0.6	0.08	7.5			Chrysotile	TAS_AHRA
B	55	B1	AQ	94	94	F	2.5	0.8	3.1			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	55	B1	CD	95		MD1-1	12	12	1.0			Chrysotile	AS>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	55	B1	CD		95	MB	10	1	10			Chrysotile	AFB>5, PCMEF-US
B	55	B1	AQ	96	96	F	4.3	1	4.3			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	56	B3	AQ	97		MD1-0	3.5	1.2	2.9			Actinolite	TAS_AHRA
B	56	B3	AQ		97	MF	2.5	0.35	7.1			Mg, Al, Si, Ca, Fe Actinolite	
B	56	B3	CD	98	98	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	56	B3	AQ	99	99	F	2.5	0.35	7.1			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	56	B3	CD	100	100	F	0.5	0.1	5.0			Chrysotile	TAS_AHRA

NSD = No Structures Detected
 PAS = Primary Asbestos Structures
 TAS = Total Asbestos Structures
 AS>5 = Asbestos Structures > 5um
 AFB>5 = Asbestos Fibers and Bundles > 5um
 PCMEF-US = PCM Equivalent Fibers-US
 PCMES-US = PCM Equivalent Structures-US
 PCMEF-ISO = PCM Equivalent Fibers-ISO
 PCMES-ISO = PCM Equivalent Structures-ISO

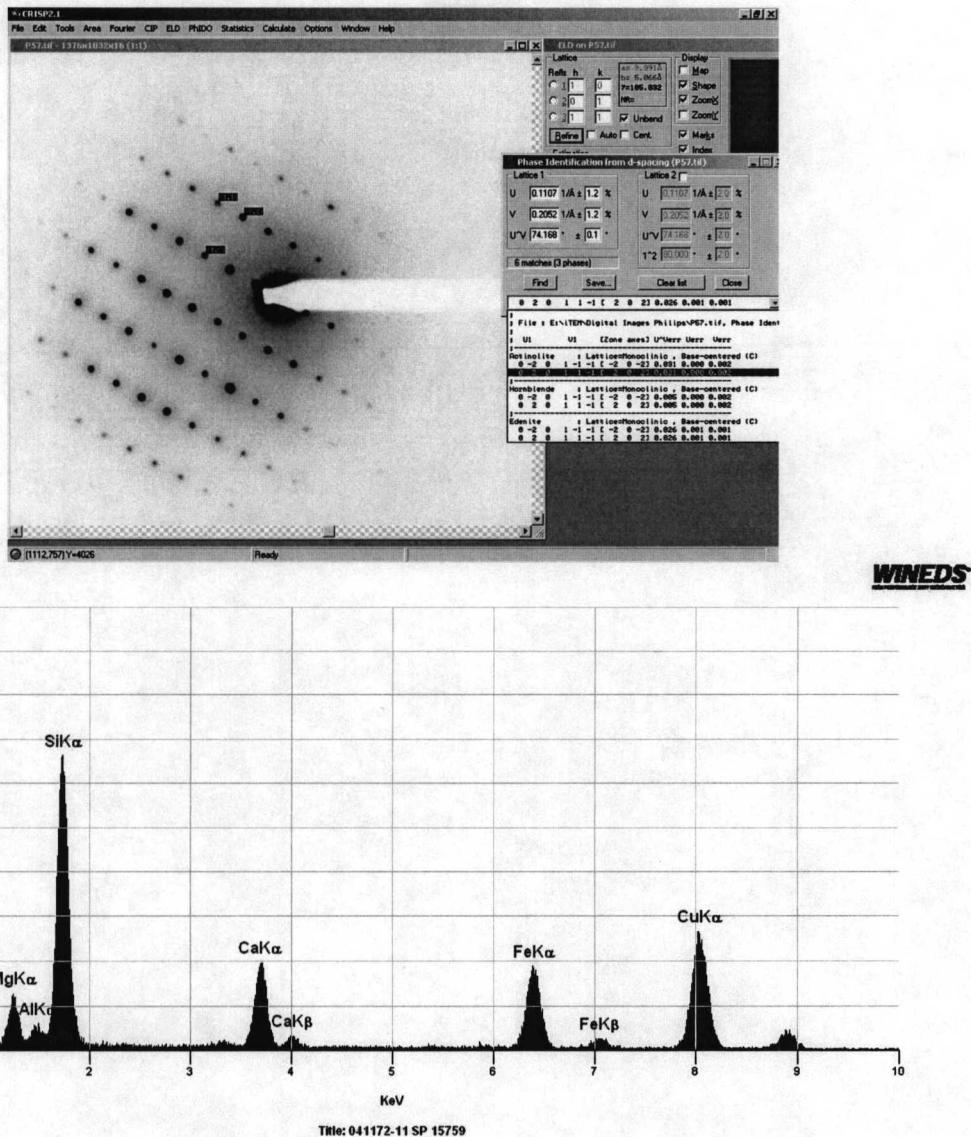
PSAS 5-10 = PROTOCOL ASB STRUCS 5-10
 PSAS >10 = PROTOCOL ASB STRUCS >10
 PSAS TOT = PROTOCOL ASB STRUCS TOTAL
 PSCH 5-10 = PROTOCOL CHRYS STRUCS 5-10
 PSCH >10 = PROTOCOL CHRYS STRUCS >10
 PSCH TOT = PROTOCOL CHRYS STRUCS TOTAL
 PSAM 5-10 = PROTOCOL AMPH STRUCS 5-10
 PSAM >10 = PROTOCOL AMPH STRUCS >10
 PSAM TOT = PROTOCOL AMPH STRUCS TOTAL

TAS_AHRA = AHERA-like Total Strucs 3:1
 AS>5_AHRA = AHERA-like Asb Strucs >5 and 3:1
 AS5-10_AHRA = AHERA-like Asb Strucs 5 - 10 and 3:1
 AS>10_AHRA = AHERA-like Asb Strucs >10 and 3:1
 TOS_AHRA = Total Other Amphibole Strucs 3:1
 OS>5_AHRA = Other Amphibole Struc >5 and 3:1
 OS5-10_AHRA = Other Amphibole Struc 5 - 10 and 3:1
 OS>10_AHRA = Other Amphibole Strucs >10 and 3:1

CF = Cleavage Fragments
 TS = Transitional Structures

PChS = Primary Chrysotile Structures
 PAmS = Primary Amphibole Structures

ACTINOLITE
 Zone Axis [1 0 1]
Neg# P57 Job# 041172-11
iTEM Image



Quantitative Analysis Results - Standardless Analysis :
041172-11 SP 15759 Tue, Feb 08 2005
 EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 9.94
 Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	6.39	MgO	11.58	0.57	11.58
Al	0.51	Al ₂ O ₃	1.16	0.16	1.16
Si	21.61	SiO ₂	58.41	1.07	58.41
Ca	4.26	CaO	10.74	0.41	10.74
Fe	5.04	Fe ₂ O ₃	18.11	0.81	18.11
<Total>		100.00	100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	58.41	Si+4	8.0000	8.0000							
Al ₂ O ₃	1.16	Al+3	0.2218	0.0000	0.2218						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	18.11	Fe+3	0.0761			0.0761	0.0000				
MgO	11.58	Mg+2	2.5098			2.5098	0.0000				
MnO	0	Fe+2	2.1144			2.1144	0.0000				
CaO	10.74	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.6766					1.6766	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	100		Excess	T site	0.2218	C site	0.0000	B site	0	A site	0

		Total	8	4.9221	1.6766	0.0000	0.0000
Prefix	none	%Fill	100	98.4426	83.8289		
Name	actinolite						
Modifier	none						
Group	Calcic Amphibole						

Sample # 041172-11-15759

Values	Satisfied Conditions
(Ca,Na)@B	1.68 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.68 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.54 (Mg/(Mg+Fe2))< 0.9
Si	8.00

B4 60

Page 1 of 5

04/11/72 1 of 5

No: 0440.01CP-0001

Cooper #:

Lab:

Lab Phone:

EPA Contract #

CHAIN OF CUSTODY RECORD

Site #: 0440.01CP

Contact Name:

Contact Phone

Lab #	Sample #	Analyses	Matrix	Date Collected	Sample Time	Numb Cont	Volume	Vol Units	Priority
-01	APG-L2-13CH-100404	ISO 10312	Air	10/4/2004	16:00	1	300.96	Liters	1
-02	APG-L2-1CH-100404	ISO 10312	Air	10/4/2004	16:00	1	298.04	Liters	1
-03	APG-L2-1ZB-100404	ISO 10312	Air	10/4/2004	16:00	1	299.76	Liters	1
-04	APG-L2-2CH-100404	ISO 10312	Air	10/4/2004	16:00	1	289.2	Liters	1
-05	APG-L2-3CH-100404	ISO 10312	Air	10/4/2004	16:00	1	295.56	Liters	1
-06	APG-L2-4CH-100404	ISO 10312	Air	10/4/2004	16:00	1	299.4	Liters	1
-07	APG-L2-5CH-100404	ISO 10312	Air	10/4/2004	16:00	1	290.64	Liters	1
-08	CC1-L6-1CA-100204	ISO 10312	Air	10/2/2004	18:24	1	569.77	Liters	1
-09	CC1-L6-1CB-100204	ISO 10312	Air	10/2/2004	18:24	1	607.18	Liters	1
-10	CC1-L6-2CB-100204	ISO 10312	Air	10/2/2004	18:24	1	597.98	Liters	1
-11	CC1-L6-3CB-100204	ISO 10312	Air	10/2/2004	18:24	1	608.15	Liters	1
-12	CC2A-L6-1CA-100304	ISO 10312	Air	10/3/2004	19:05	1	269.72	Liters	1
-5	CC2-H8-1CT-100304	ISO 10312	Air	10/3/2004	18:17	1	5013.54	Liters	
-55	CC2-H8-2CT-100304	ISO 10312	Air	10/3/2004	18:12	1	3647.28	Liters	
-56	CC2-H8-3CT-100304	ISO 10312	Air	10/3/2004	18:35	1	4690	Liters	
-57	CC2-H8-4CT-100304	ISO 10312	Air	10/3/2004	18:47	1	4366.96	Liters	
-58	CC2-H8-5CT-100304	ISO 10312	Air	10/3/2004	17:52	1	3479.53	Liters	
-1	CC2-L6-11CC-100304	ISO 10312	Air	10/3/2004	19:05	1	530.45	Liters	1
-1	CC2-L6-1CC-100304	ISO 10312	Air	10/3/2004	19:05	1	533.62	Liters	1
-1	CC2-L6-2CC-100304	ISO 10312	Air	10/3/2004	19:05	1	523	Liters	1

Comments: ISO 10312 PER STATEMENT OF WORK. STANDARD TURN AROUND TIME

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

SAMPLE SET #1

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	Melv	10/6/04	FED-X S/L#	10/6/04	1845						
			829691973701								
			D Jones	10/7/04	9:45						

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No: 0440.01CP-0001

Cooler #:

Lab:

Lab Phone:

EPA Contract #:

CHAIN OF CUSTODY RECORD

Site #: 0440.01CP

Contact Name

Contact Phone:

Lab #	Sample #	Analyses	Matrix	Date Collected	Sample Time	Numb Cont	Volume	Vol Units	Priority
- 10	CC2-L6-3CC-100304	ISO 10312	Air	10/3/2004	19:05	1	520.12	Liters	1
- 11	CC2-L6-4CC-100304	ISO 10312	Air	10/3/2004	1905	1	542.69	Liters	1
- 3	RHB-H2-1FD-100304	ISO 10312	Air	10/3/2004	19:07	1	1186.08	Liters	2
- 3	RHB-H2-2FD-100304	ISO 10312	Air	10/3/2004	19:07	1	1220	Liters	2
- 3	RHB-H2-3FD-100304	ISO 10312	Air	10/3/2004	19:07	1	1140.7	Liters	2
- 5	RHB-H2-4FD-100304	ISO 10312	Air	10/3/2004	19:05	1	1207.2	Liters	
- 6	RHB-H2-5FD-100304	ISO 10312	Air	10/3/2004	19:05	1	1083.32	Liters	
- 6	RHB-L2-14CH-100304	ISO 10312	Air	10/3/2004	19:05	1	301.32	Liters	
- 3	RHB-L2-1CH-100304	ISO 10312	Air	10/3/2004	19:05	1	309.12	Liters	2
- 6	RHB-L2-1NA-100304	ISO 10312	Air	10/3/2004	19:05	1	318.6	Liters	
- 6	RHB-L2-1ZB-100304	ISO 10312	Air	10/3/2004	19:05	1	326.4	Liters	
- 3	RHB-L2-2CH-100304	ISO 10312	Air	10/3/2004	19:05	1	293.4	Liters	2
- 3	RHB-L2-3CH-100304	ISO 10312	Air	10/3/2004	19:05	1	306.48	Liters	2
- 3	RHB-L2-4CH-100304	ISO 10312	Air	10/3/2004	19:05	1	312.48	Liters	2
- 3	RHB-L2-5CH-100304	ISO 10312	Air	10/3/2004	19:05	1	295.56	Liters	2
- 6	RHB-L2-FB-100304	ISO 10312	Air	10/3/2004		1			Filter Blank
- 6	RHS-H2-1FD-100304	ISO 10312	Air	10/3/2004	16:21	1	455.68	Liters	
- 6	RHS-H2-2FD-100304	ISO 10312	Air	10/3/2004	16:22	1	472.81	Liters	
- 6	RHS-H2-3FD-100304	ISO 10312	Air	10/3/2004	16:23	1	480.95	Liters	
- 6	RHS-H2-4FD-100304	ISO 10312	Air	10/3/2004	16:21	1	931.5	Liters	

Comments: ISO 10312 PER STATEMENT OF WORK. STANDARD TURN AROUND TIME

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

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04/11/72 3 of 5

No: 0440.01CP-0001

Cooler #:

1 ah:

Lab Phone:

EPA Contract #:

CHAIN OF CUSTODY RECORD

Site #: 0440-01CP

Contact Name

Contact Phone:

Lab	Sample #	Analyses	Matrix	Date Collected	Sample Time	Numb Cont	Volume	Vol Units	Priority
-6	RHS-H2-5FD-100304	ISO 10312	Air	10/3/2004	16:21	1	935.53	Liters	
-7	RHS-L2-14CH-100304	ISO 10312	Air	10/3/2004	16:18	1	223.65	Liters	
-7	RHS-L2-1CH-100304	ISO 10312	Air	10/3/2004	16:18	1	221.94	Liters	
-7	RHS-L2-1NA-100304	ISO 10312	Air	10/3/2004	16:18	1	223.83	Liters	
-7	RHS-L2-2CH-100304	ISO 10312	Air	10/3/2004	16:18	1	232.47	Liters	
-7	RHS-L2-3CH-100304	ISO 10312	Air	10/3/2004	16:18	1	229.32	Liters	
-7	RHS-L2-4CH-100304	ISO 10312	Air	10/3/2004	16:18	1	228.06	Liters	
-7	RHS-L2-5CH-100304	ISO 10312	Air	10/3/2004	16:18	1	233.06	Liters	
-18	SVBA-H2-1FD-100204	ISO 10312	Air	10/2/2004	1826	1	556.69	Liters	1
-19	SVBA-H2-2FD-100204	ISO 10312	Air	10/2/2004	18:25	1	531.47	Liters	1
-2	SVBA-H2-3FD-100204	ISO 10312	Air	10/2/2004	18:25	1	562.41	Liters	1
-7	SVBA-H2-4FD-100204	ISO 10312	Air	10/2/2004	18:24	1	1195.08	Liters	
-7	SVBA-H2-5FD-100204	ISO 10312	Air	10/2/2004	18:24	1	1198.92	Liters	
-3	SVBA-L2-11CH-100204	ISO 10312	Air	10/2/2004	1824	1	296.24	Liters	2
-4	SVBA-L2-1CH-100204	ISO 10312	Air	10/2/2004	18:24	1	292.44	Liters	2
-7	SVBA-L2-1NA-100204	ISO 10312	Air	10/2/2004	18:24	1	293.4	Liters	
-8	SVBA-L2-1ZB-100204	ISO 10312	Air	10/2/2004	19:07	1	301.32	Liters	
-4	SVBA-L2-2CH-100204	ISO 10312	Air	10/2/2004	18:24	1	297.72	Liters	2
-4	SVBA-L2-3CH-100204	ISO 10312	Air	10/2/2004	18:24	1	299.52	Liters	2
-4	SVBA-L2-4CH-100204	ISO 10312	Air	10/2/2004	18:24	1	293.28	Liters	2

Comments: ISO 10312 PER STATEMENT OF WORK, STANDARD TURN AROUND TIME	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #
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No: 0440.01CP-0001

Cooler #:

Lab:

Lab Phone:

EPA Contract #

CHAIN OF CUSTODY RECORD

Site #: 0440-01CP

Contact Name:

Contact Phone

Lab #	Sample #	Analyses	Matrix	Date Collected	Sample Time	Numb Cont	Volume	Vol Units	Priority
-4	SVBA-L2-5CH-100204	ISO 10312	Air	10/2/2004	18:24	1	291.12	Liters	2
-81	SVBB-H2-12FD-100304	ISO 10312	Air	10/3/2004	12:10	1	557.15	Liters	
-20	SVBB-H2-1FD-100304	ISO 10312	Air	10/3/2004	12:09	1	611.75	Liters	1
-23	SVBB-H2-2FD-100304	ISO 10312	Air	10/3/2004	12:10	1	563.3	Liters	1
-25	SVBB-H2-3FD-100304	ISO 10312	Air	10/3/2004	12:08	1	580.91	Liters	1
-82	SVBB-H2-4FD-100304	ISO 10312	Air	10/3/2004	12:05	1	1205.89	Liters	
-83	SVBB-H2-5FD-100304	ISO 10312	Air	10/3/2004	12:05	1	1210	Liters	
-45	SVBB-L2-12CH-100304	ISO 10312	Air	10/3/2004	12:05	1	288.75	Liters	2
-46	SVBB-L2-1CH-100304	ISO 10312	Air	10/3/2004	12:06	1	302.56	Liters	2
-84	SVBB-L2-1NA-100304	ISO 10312	Air	10/3/2004	12:06	1	306.71	Liters	
-85	SVBB-L2-1ZB-100304	ISO 10312	Air	10/3/2004	12:06	1	302.56	Liters	
-47	SVBB-L2-2CH-100304	ISO 10312	Air	10/3/2004	12:05	1	309.16	Liters	2
-48	SVBB-L2-3CH-100304	ISO 10312	Air	10/3/2004	12:05	1	312.66	Liters	2
-49	SVBB-L2-4CH-100304	ISO 10312	Air	10/3/2004	12:05	1	299.35	Liters	2
-50	SVBB-L2-5CH-100304	ISO 10312	Air	10/3/2004	12:05	1	313.51	Liters	2
-51	SVM-H2-1FD-100204	ISO 10312	Air	10/2/2004	13:16	1	1209.75	Liters	2
-52	SVM-H2-2FD-100204	ISO 10312	Air	10/2/2004	13:16	1	1192.92	Liters	2
-53	SVM-H2-3FD-100204	ISO 10312	Air	10/2/2004	13:16	1	1215.12	Liters	2
-54	SVM-H2-4FD-100204	ISO 10312	Air	10/2/2004	13:15	1	1194.88	Liters	
-55	SVM-H2-5FD-100204	ISO 10312	Air	10/2/2004	13:16	1	1194.26	Liters	

Comments: ISO 10312 PER STATEMENT OF WORK, STANDARD TURN AROUND TIME

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No: 0440.01CP-0001

Cooler #:

Lab:

Lab Phone:

CHAIN OF CUSTODY RECORD

Site #: 0440.01CF

Contact Name

Contact Phone

EPA Contract #:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Comments: ISO 10312 PER STATEMENT OF WORK, STANDARD TURN AROUND TIME

QC Summary Sheet

Project: El Dorado - Indirect Samples
 LC Job No.: 041172, 041188, 041191, 041210
 Total Samples: 59
 Total QC Samples: 15
 Average GO Area: 0.01449

QC Type	Tally
Replicate - Same GO's	4
Replicate - Reprep	2
Duplicate - Same GO's	3
Duplicate - Different Grids	3
Duplicate - Reprep	3
Total	15

Original Analyst	Original LC Number	Original Client Number	Reference LC Num	QC Analyst	Primary Structures				95% Poisson Confidence Limits			
					QC Type	Original Counts		Test Counts		Lower Total	Upper Total	QC Result
						Total	No. GO's	Total	No. GO's			
KM	041191-109	JEG-H2-2FD-101005	050580-01	DW	Duplicate - Same GO's	21	46	15	46	13.00	32.10	PASS
TM	041188-15	NFB-H2-3FD-100504	050580-02	DW	Duplicate - Reprep	9	88	17	84	4.12	17.09	PASS
TM	041188-15	NFB-H2-3FD-100504	050580-03	JH	Duplicate - Reprep	9	88	15	88	4.12	17.09	PASS
TM	041188-15	NFB-H2-3FD-100504	050580-04	TM	Replicate - Same GO's	9	88	16	88	4.12	17.09	PASS
KM	041191-108	JEG-H2-1FD-101004	050580-05	KM	Replicate - Same GO's	24	56	23	57	15.38	35.71	PASS
KM	041191-109	JEG-H2-2FD-101005	050580-06	JH	Duplicate - Different Grids	21	46	19	46	13.00	32.10	PASS
KM	041191-109	JEG-H2-2FD-101005	050580-07	KM	Replicate - Reprep	21	46	20	46	13.00	32.10	PASS
JH	041191-112	JEG-H2-5FD-101007	050580-08	DW	Duplicate - Different Grids	15	43	9	43	8.40	24.74	PASS
DW	041191-87	NYB-H2-3FD-100704	050580-09	KM	Duplicate - Same GO's	8	91	13	91	7.60	15.76	PASS
JH	041191-112	JEG-H2-5FD-101007	050580-10	JH	Replicate - Same GO's	15	43	14	43	8.40	24.74	PASS
JH	041191-112	JEG-H2-5FD-101007	050580-11	DW	Duplicate - Same GO's	15	43	9	42	8.40	24.74	PASS
KM	041191-109	JEG-H2-2FD-101005	050580-12	DW	Duplicate - Reprep	21	46	13	46	13.00	32.10	PASS
JH	041191-112	JEG-H2-5FD-101007	050580-13	KM	Duplicate - Different Grids	15	43	19	43	8.40	24.74	PASS
KM	041210-46	AAMS-D09-100504	050580-14	KM	Replicate - Reprep	34	49	26	49	23.55	47.51	PASS
DW	041191-87	NYB-H2-3FD-100704	050580-15	DW	Replicate - Same GO's	8	91	13	90	7.60	15.76	PASS

QC Parameters

Pass - Test value (s/mm²) between reference upper and lower 95% confidence limits, inclusive
 Fail - Test value (s/mm²) outside reference upper and lower 95% confidence limits, exclusive

Lab Process Blank

Prepper	Prep Date	Analyst	Analysis Date	Sample Number	# of Grid Openings	# of Structures
MH	1/13/2005	KM	4/14/2005	050580-16	60	0
KM	3/16/2005					

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Microscope Based Quality Control Summary Table
April 2005

Historical Averages (Philips 410LS)							Historical Averages (Jeol 1200)						
Mag	Freq	MAvg	HAvg	Accpt	Date	Status	Freq	MAvg	HAvg	Accpt	Date	Status	
- 550x	Mthly	552.6	567	PASS	4/14/2005	DONE	Mthly	4761		**	4/13/2005	DONE	
- 10K	Mthly	10306.29	10457	PASS	4/14/2005	DONE	Mthly	9666		**	4/13/2005	DONE	
- 18K	Mthly	17955	18100	PASS	4/14/2005	DONE	Mthly	18267		**	4/13/2005	DONE	
EDS													
- (K-factor)Mg:Fe	BiYrly	1.35	1.5	PASS	1/11/2005	DONE	BiYrly	0.74	1.5	PASS	3/14/2005	DONE	
- Mn Resol.	Mthly	151	175	PASS	4/14/2005	DONE	Mthly	159	175	PASS	4/7/2005	DONE	
Misc. Calibrations													
CL	Wkly	718.09	723	PASS	4/8/2005	DONE	Wkly	806		**	4/7/2005	DONE	
Dose	Qrtly			PASS	2/9/2005	DONE	Qrtly			PASS	3/18/2005	DONE	
SRM 1876b	Yrly			PASS	7/1/2004	DONE	Yrly			PASS	7/1/2004	DONE	
Albite Std	BiYrly			PASS	1/7/2005	DONE	BiYrly			PASS	12/16/2005	DONE	
Na Croc. Std Peak	Mthly			PASS	4/14/2005	DONE	Mthly			PASS	4/7/2005	DONE	
Plasma Asher	BiYrly			PASS	3/18/2005	DONE	Qrtly			PASS	3/18/2005	DONE	
Deficiency Corrections		None											
Sample Custody Errors		None											

**No Historical Average available.

PHILIPS 420

Screen and Camera Magnification Calibration

Date of Measurement: 4/14/2005

Analyst: MP

Average:

Screen Magnification at 18,000:	17473.90
Screen Magnification at 10,000:	9905.33

Camera Magnification at 18,000:	17955.00
Camera Magnification at 10,000:	10306.29
Camera Magnification at 550:	552.60

Setting 18,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/14/2005	5896	45.25	145.00	99.75	12.00	17955.00

Screen

Date	# Spaces	Magnification
4/14/2005	19.16	17473.90

Setting 10,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/14/2005	5897	32.00	98.80	66.80	14.00	10306.29

Screen

Date	# Spaces	Magnification
4/14/2005	33.80	9905.33

Setting 550

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/14/2005	5898	63.50	78.85	15.35	60.00	552.60

D1 = The smaller measurement of the Supper Device in mm.

D2 = The larger measurement of the Supper Device in mm.

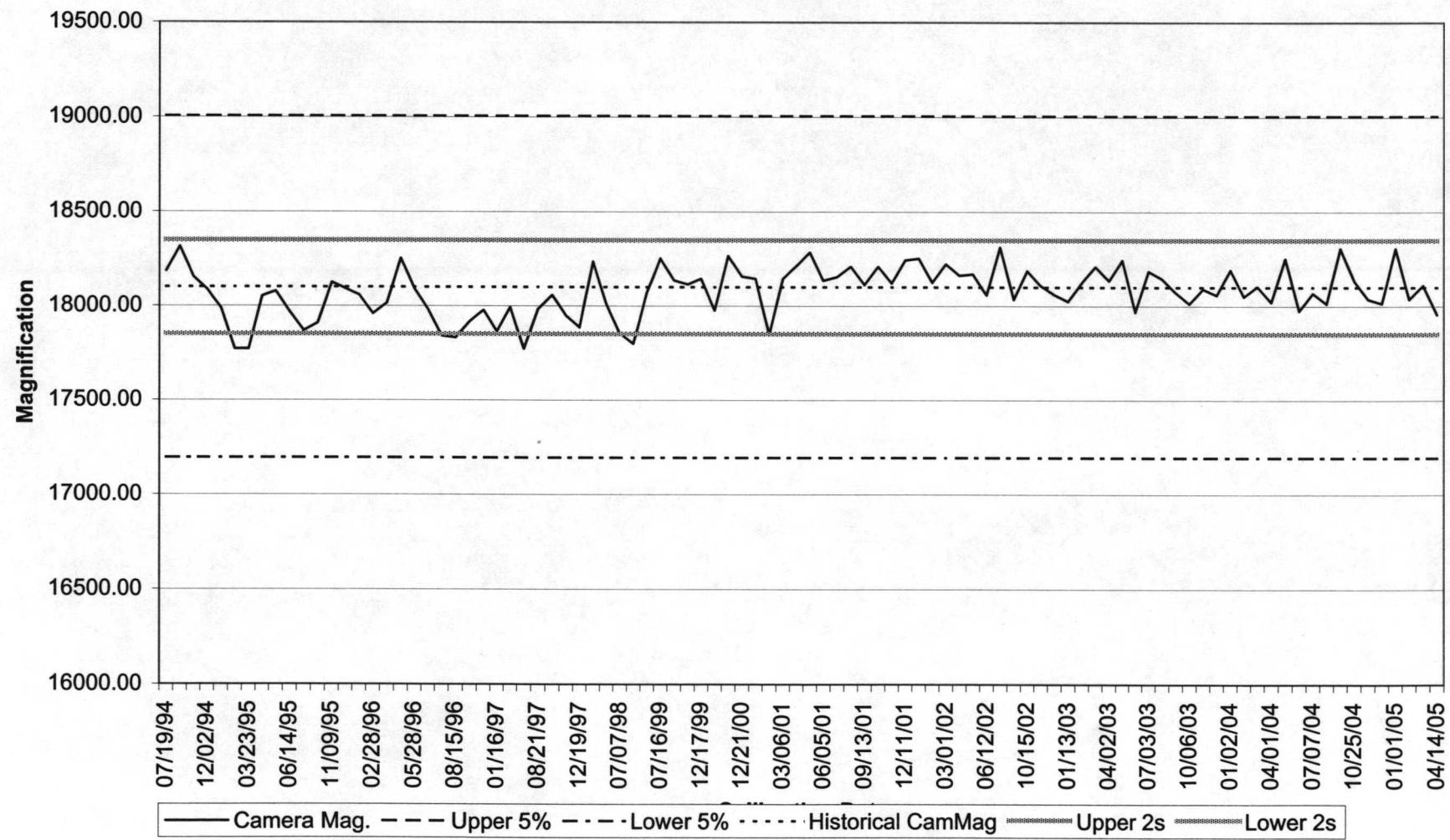
D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

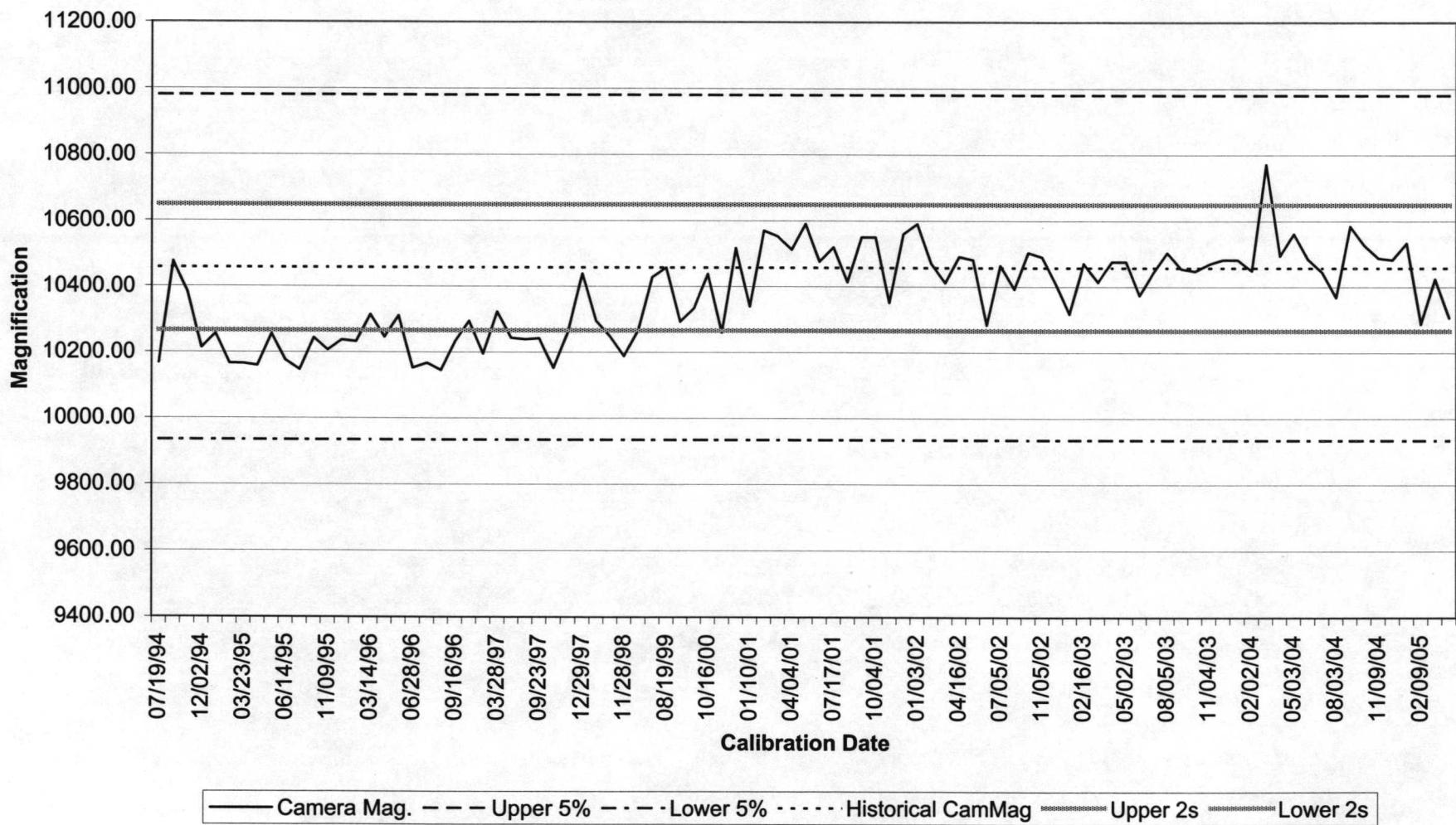
Philips 410 - Camera Magnification Calibration
Setting 18,000
07/94 to 04/05



Philips 410 - Camera Magnification Calibration

Setting 10,000

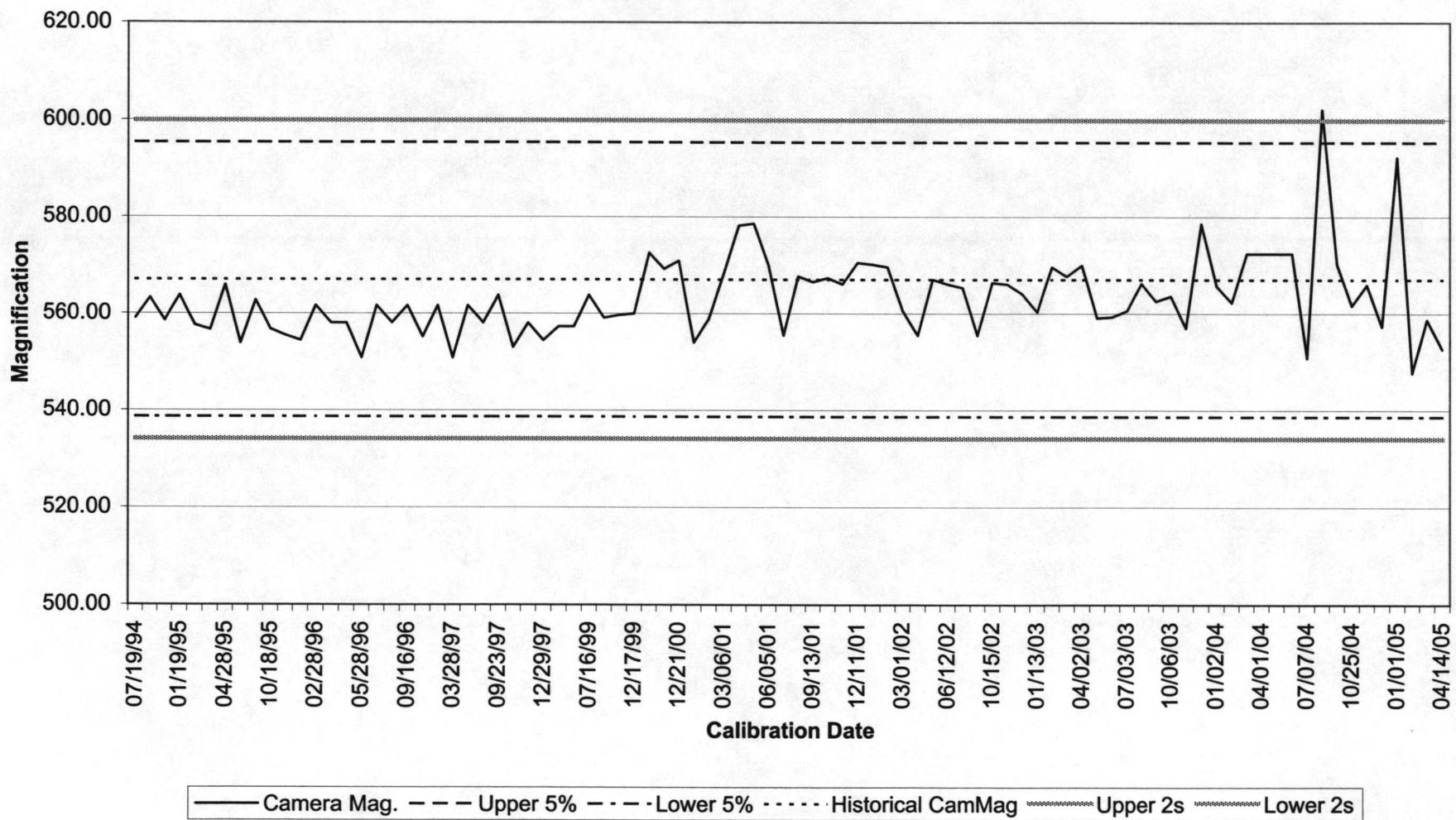
07/94 to 04/05



Philips 410 - Camera Magnification Calibration

Setting 550

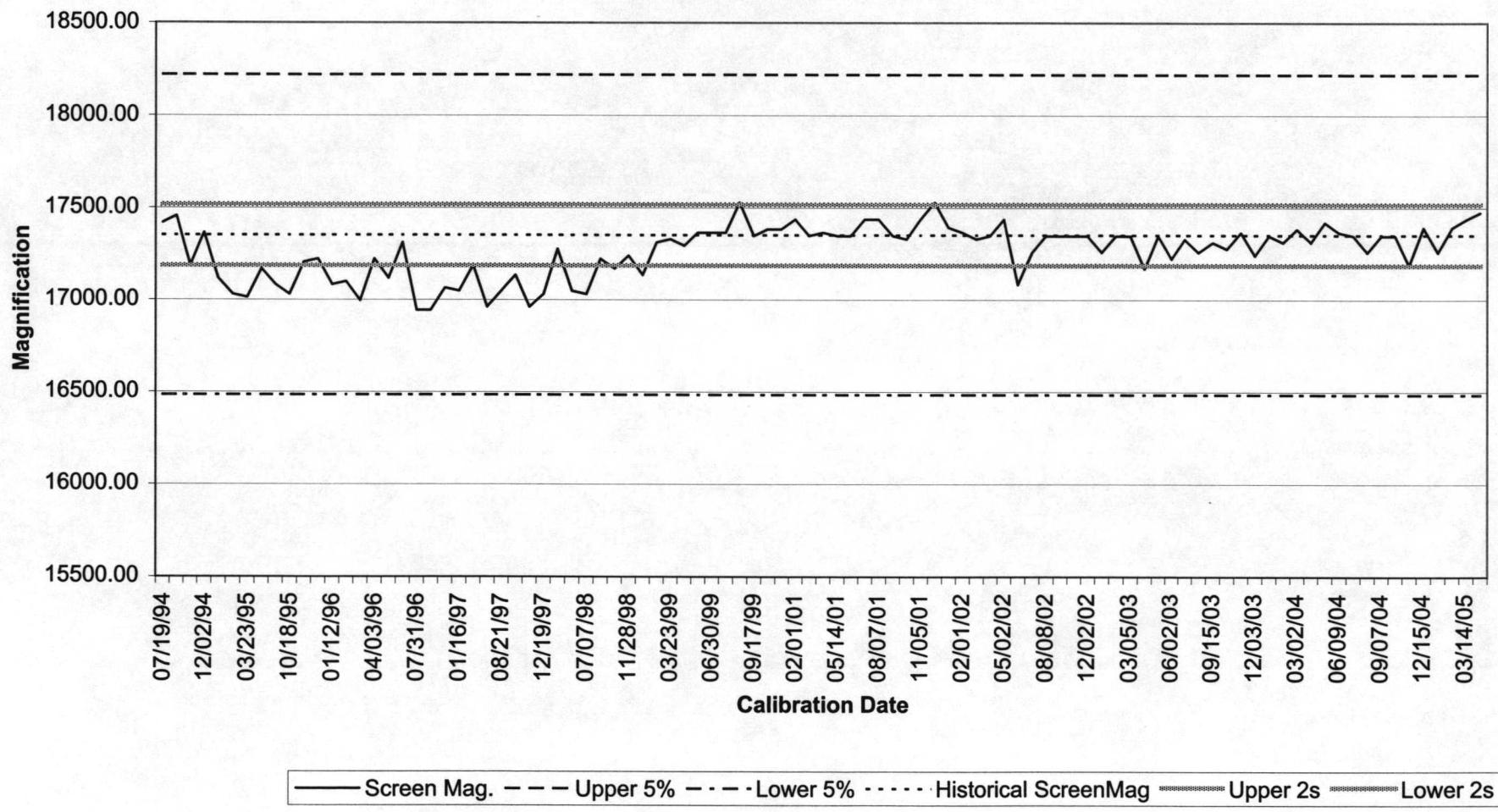
07/94 to 04/05



Philips 410 - Screen Magnification Calibration

Setting 18,000

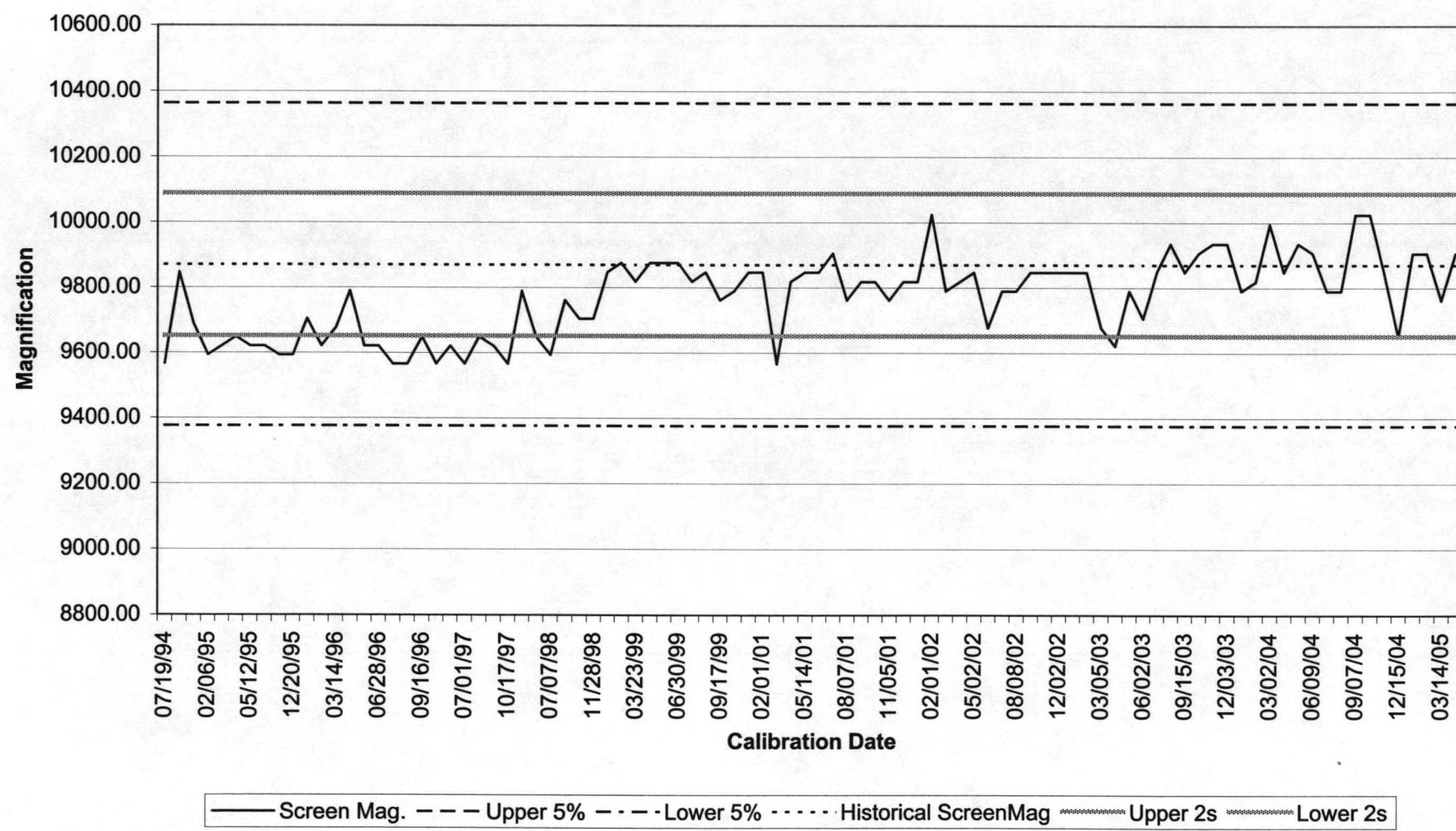
07/94 to 04/05



Philips 410 - Screen Magnification Calibration

Setting 10,000

07/94 to 04/05



Screen Magnification Calibration (Philips 410)

(Version#1)

Date of Measurement: 4/10/05

Analyst: MQ

Average:

Screen Magnification at 18,000:	17474
Screen Magnification at 10,000:	9905

Setting 18,000

Screen

Date	# Spaces	Magnification
4/10/2005	19.16	17474

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
4/10/2005	5.22	5.07

Small Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
4/10/2005	0.52	0.51

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
4/10/2005	4.58	4.44	0.057	0.572

Setting 10,000

Screen

Date	# Spaces	Magnification
4/10/2005	33.8	9905

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
4/10/2005	9.22	9.13

Small Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
4/10/2005	0.92	0.913

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
4/10/2005	8.08	8.00	0.101	1.010

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

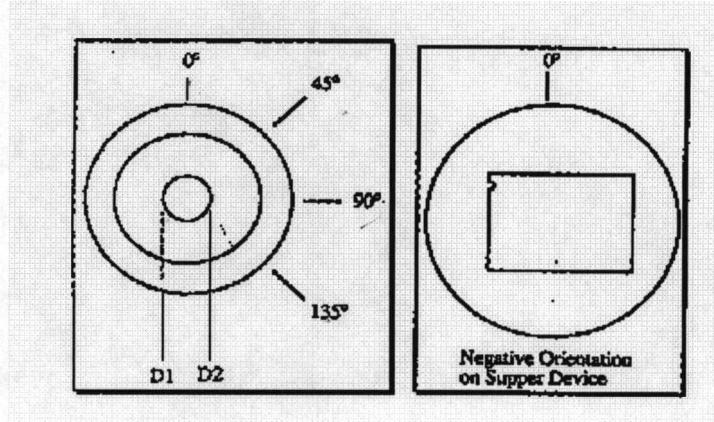
Screen Magnification = (155/# spaces) * 2160

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	4/13/2005	Average Camera Constant:	26.569 mmA
Negative Number:	5895	(All 12 Measurements)	
Date Negative was Taken:	4/8/2005	Average Camera Length:	718.09 mm
Analyst:	MP	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	63.35	86.15	22.80	11.40	26.85	725.59	53.65	76.00	22.35	11.18	26.32	711.27
2	61.60	87.90	26.30	13.15	26.81	724.67	51.90	77.75	25.85	12.93	26.35	712.27
3	55.95	93.25	37.30	18.65	26.89	726.85	46.40	83.10	36.70	18.35	26.46	715.15

Ring #	90 degrees						135 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	53.00	75.30	22.30	11.15	26.26	709.68	63.25	86.00	22.75	11.38	26.79	724.00
2	51.25	77.00	25.75	12.88	26.25	709.52	61.50	87.70	26.20	13.10	26.71	721.92
3	45.80	82.45	36.65	18.33	26.42	714.18	56.15	93.20	37.05	18.53	26.71	721.97



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D₁ = The smaller measurement on the Supper device (mm).

D₂ = The larger measurement on the Supper device (mm).

$$D = D_2 - D_1$$

$$R = D/2$$

CC = Camera Constant

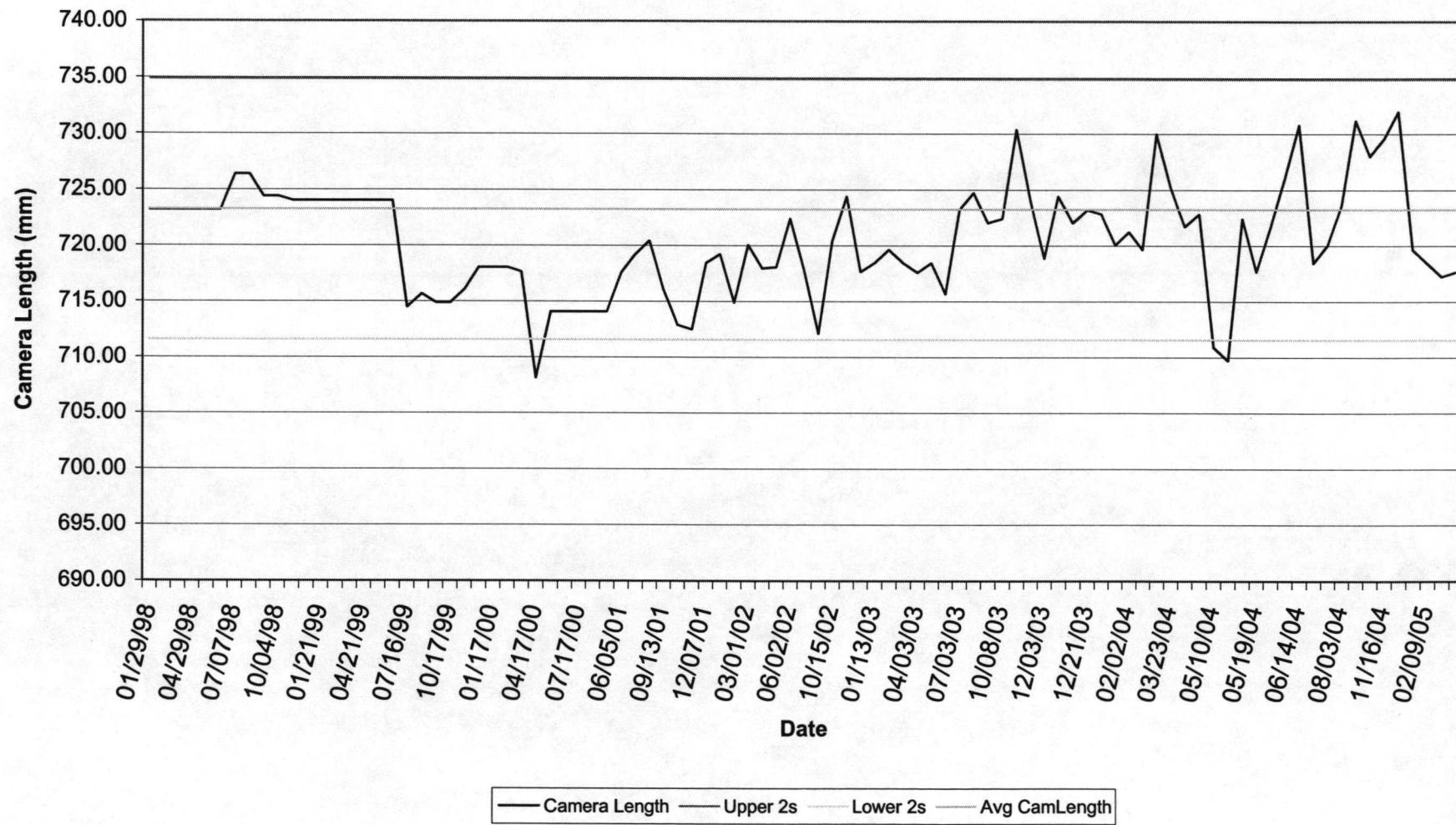
For Ring 1 [111], CC = R*2.355

For Ring 2 [200], CC = R*2.039

For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

Camera Length - Philips 410 (100KV)
January 1998 - April 2005



Calibration	Avg. Cam. Const.	Date	Camera Length	Upper 2.5%	Lower 2.5%	STD. Err.	Upper 2s	Lower 2s	2s	Negative
139	26.55	12/16/02	717.64	741.33	705.16	723.24	734.88	711.61	11.64	2677
140	26.58	01/13/03	718.43	741.33	705.16	723.24	734.88	711.61	11.64	2723
141	26.63	02/01/03	719.63	741.33	705.16	723.24	734.88	711.61	11.64	2790
142	26.58	03/05/03	718.43	741.33	705.16	723.24	734.88	711.61	11.64	2951
143	26.55	04/03/03	717.56	741.33	705.16	723.24	734.88	711.61	11.64	3027
144	26.58	05/02/03	718.43	741.33	705.16	723.24	734.88	711.61	11.64	3156
145	26.48	6/1/003	715.65	741.33	705.16	723.24	734.88	711.61	11.64	3156
146	26.76	07/03/03	723.21	741.33	705.16	723.24	734.88	711.61	11.64	3446
147	26.81	08/05/03	724.72	741.33	705.16	723.24	734.88	711.61	11.64	3580
148	26.71	09/16/03	722.01	741.33	705.16	723.24	734.88	711.61	11.64	3708
149	26.73	10/08/03	722.41	741.33	705.16	723.24	734.88	711.61	11.64	3875
150	27.02	11/06/03	730.37	741.33	705.16	723.24	734.88	711.61	11.64	3966
151	26.79	11/24/03	724.00	741.33	705.16	723.24	734.88	711.61	11.64	4076
152	26.60	12/03/03	718.83	741.33	705.16	723.24	734.88	711.61	11.64	4054
153	26.80	12/08/03	724.40	741.33	705.16	723.24	734.88	711.61	11.64	4077
154	26.71	12/15/03	722.01	741.33	705.16	723.24	734.88	711.61	11.64	4081
155	26.76	12/21/03	723.21	741.33	705.16	723.24	734.88	711.61	11.64	4093
156	26.74	12/31/03	722.81	741.33	705.16	723.24	734.88	711.61	11.64	4105
157	26.64	01/12/04	720.03	741.33	705.16	723.24	734.88	711.61	11.64	4159
158	26.69	02/02/04	721.22	741.33	705.16	723.24	734.88	711.61	11.64	4218
159	26.63	03/08/04	719.63	741.33	705.16	723.24	734.88	711.61	11.64	4293
160	27.01	03/18/04	729.97	741.33	705.16	723.24	734.88	711.61	11.64	4314
161	26.83	03/23/04	725.20	741.33	705.16	723.24	734.88	711.61	11.64	4354
162	26.70	04/05/04	721.70	741.33	705.16	723.24	734.88	711.61	11.64	4394
163	26.74	05/03/04	722.81	741.33	705.16	723.24	734.88	711.61	11.64	4578
164	26.30	05/10/04	710.88	741.33	705.16	723.24	734.88	711.61	11.64	4645
165	26.26	05/10/04	709.68	741.33	705.16	723.24	734.88	711.61	11.64	4646
166	26.73	05/18/04	722.41	741.33	705.16	723.24	734.88	711.61	11.64	4743
167	26.55	05/19/04	717.64	741.33	705.16	723.24	734.88	711.61	11.64	4768
168	26.70	06/09/04	721.62	741.33	705.16	723.24	734.88	711.61	11.64	4889
169	26.86	06/14/04	725.99	741.33	705.16	723.24	734.88	711.61	11.64	4921
170	27.04	06/14/04	730.77	741.33	705.16	723.24	734.88	711.61	11.64	4922
171	26.58	07/07/04	718.43	741.33	705.16	723.24	734.88	711.61	11.64	4960
172	26.64	07/19/04	720.03	741.33	705.16	723.24	734.88	711.61	11.64	4999
173	26.77	08/03/04	723.61	741.33	705.16	723.24	734.88	711.61	11.64	5018
174	27.05	09/13/04	731.16	741.33	705.16	723.24	734.88	711.61	11.64	5126
175	26.94	10/25/04	727.98	741.33	705.16	723.24	734.88	711.61	11.64	5343
176	26.99	11/16/04	729.57	741.33	705.16	723.24	734.88	711.61	11.64	5503
177	27.08	12/15/04	731.96	741.33	705.16	723.24	734.88	711.61	11.64	5721
178	26.63	01/11/05	719.63	741.33	705.16	723.24	734.88	711.61	11.64	5786
179	26.58	02/09/05	718.43	741.33	705.16	723.24	734.88	711.61	11.64	5869
180	26.54	03/14/05	717.24	741.33	705.16	723.24	734.88	711.61	11.64	5883
181	26.55	04/14/05	717.64	741.33	705.16	723.24	734.88	711.61	11.64	5895

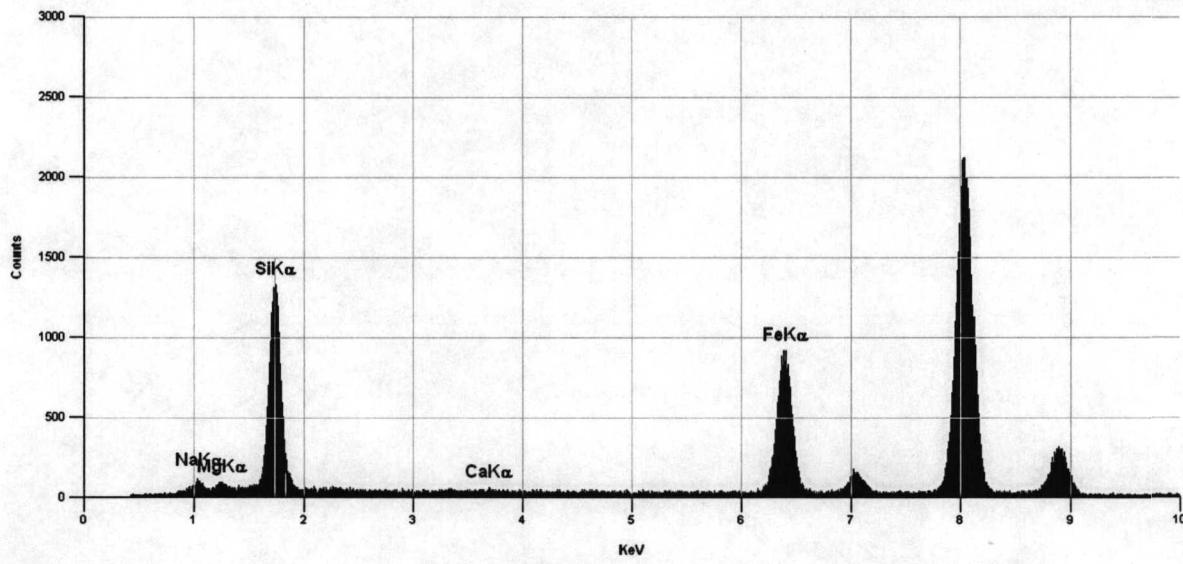
$0^\circ A$	D°	$0^\circ S$	Radius	K	Cam. Const.	Cam. ln.	$45^\circ A$	D°	$0^\circ S$	Radius	K	Cam. Const.	Cam. ln.	$90^\circ A$	D°	Radius
60.8	83.4	11.30	2.355	26.612	719.23	60.7	83.3	11.28	2.355	26.553	717.64	66.2	88.8	11.30		
70.3	93.1	11.40	2.355	26.847	725.59	68.9	91.7	11.40	2.355	26.847	725.59	68.2	90.0	10.90		
71.2	93.5	11.15	2.355	26.258	709.68	71.1	93.8	11.35	2.355	26.729	722.41	70.5	93.2	11.33		
57.1	79.7	11.28	2.355	26.553	717.64	64.6	87.2	11.28	2.355	26.553	717.64	76.0	98.6	11.30		
64.4	87.0	11.32	2.355	26.659	720.50	60.8	83.2	11.23	2.355	26.435	714.46	61.3	83.8	11.28		
55.1	77.7	11.28	2.355	26.553	717.64	62.6	85.2	11.28	2.355	26.553	717.64	74.0	96.6	11.30		
79.5	101.9	11.18	2.355	26.317	711.27	78.3	100.7	11.20	2.355	26.376	712.86	72.4	95.0	11.33		
58.1	80.8	11.38	2.355	26.788	724.00	59.5	82.2	11.35	2.355	26.729	722.41	67.3	90.0	11.35		
78.0	100.8	11.40	2.355	26.835	725.28	72.4	95.1	11.38	2.355	26.788	724.00	65.4	88.1	11.38		
57.1	79.7	11.33	2.355	26.670	720.82	57.2	79.8	11.33	2.355	26.670	720.82	64.9	87.6	11.35		
57.3	79.9	11.33	2.355	26.670	720.82	58.1	80.8	11.33	2.355	26.670	720.82	66.1	88.8	11.35		
74.4	97.4	11.48	2.355	27.024	730.37	77.1	100.0	11.48	2.355	27.024	730.37	75.5	98.5	11.48		
66.8	89.6	11.38	2.355	26.788	724.00	65.7	88.5	11.38	2.355	26.788	724.00	67.3	90.1	11.38		
65.6	88.2	11.33	2.355	26.670	720.82	67.9	90.5	11.30	2.355	26.612	719.23	71.5	94.1	11.30		
67.5	90.3	11.40	2.355	26.847	725.59	58.5	81.2	11.35	2.355	26.729	722.41	56.5	79.3	11.38		
66.5	89.3	11.40	2.355	26.847	725.59	65.2	87.9	11.35	2.355	26.729	722.41	67.0	89.6	11.30		
67.4	90.1	11.35	2.355	26.729	722.41	69.5	92.2	11.33	2.355	26.670	720.82	72.0	94.8	11.38		
68.3	91.0	11.38	2.355	26.788	724.00	70.3	92.9	11.33	2.355	26.670	720.82	72.2	94.9	11.35		
73.9	96.5	11.33	2.355	26.670	720.82	71.6	94.1	11.28	2.355	26.553	717.64	68.5	91.2	11.33		
78.2	100.9	11.35	2.355	26.729	722.41	80.6	103.3	11.33	2.355	26.670	720.82	76.9	99.5	11.30		
74.3	96.9	11.30	2.355	26.612	719.23	69.4	92.0	11.30	2.355	26.612	719.23	64.9	87.5	11.28		
66.5	89.3	11.40	2.355	26.847	725.59	68.2	90.8	11.33	2.355	26.670	720.82	71.1	93.8	11.35		
72.0	94.8	11.40	2.355	26.847	725.59	64.4	87.2	11.43	2.355	26.906	727.19	60.1	82.8	11.33		
62.1	84.8	11.35	2.355	26.729	722.41	63.3	86.0	11.35	2.355	26.729	722.41	68.6	91.3	11.36		
62.7	85.4	11.35	2.355	26.729	722.41	72.0	94.8	11.38	2.355	26.788	724.00	76.8	99.6	11.40		
63.6	85.9	11.18	2.355	26.317	711.27	67.2	89.5	11.18	2.355	26.317	711.27	72.7	95.0	11.15		
62.7	84.9	11.13	2.355	26.199	708.09	67.4	89.7	11.18	2.355	26.317	711.27	73.8	96.2	11.20		
61.7	84.3	11.30	2.355	26.612	719.23	64.0	86.8	11.40	2.355	26.847	725.59	70.0	92.7	11.35		
62.2	84.8	11.30	2.355	26.612	719.23	62.5	85.1	11.28	2.355	26.553	717.64	67.3	89.9	11.30		
69.4	92.1	11.35	2.355	26.729	722.41	59.8	82.5	11.35	2.355	26.729	722.41	56.4	79.0	11.33		
68.6	91.5	11.43	2.355	26.906	727.19	70.3	93.0	11.35	2.355	26.729	722.41	71.9	94.7	11.43		
63.7	86.6	11.45	2.355	26.965	728.78	63.2	86.2	11.53	2.355	27.141	733.55	67.3	90.4	11.55		
58.1	80.7	11.30	2.355	26.612	719.23	65.7	88.3	11.33	2.355	26.670	720.82	76.0	98.5	11.25		
76.7	99.3	11.33	2.355	26.670	720.82	67.8	90.4	11.30	2.355	26.612	719.23	60.4	83.0	11.30		
67.2	90.0	11.40	2.355	26.847	725.59	63.4	86.0	11.30	2.355	26.612	719.23	63.5	86.2	11.35		
55.9	78.9	11.50	2.355	27.083	731.96	60.9	83.9	11.50	2.355	27.083	731.96	71.3	94.3	11.50		
55.6	78.5	11.43	2.355	26.906	727.19	64.5	87.4	11.43	2.355	26.906	727.19	76.7	99.6	11.45		
56.9	79.9	11.50	2.355	27.083	731.96	64.3	87.3	11.48	2.355	27.024	730.37	75.3	98.2	11.45		
61.5	84.5	11.48	2.355	27.024	730.37	67.9	91.0	11.53	2.355	27.141	733.55	75.8	98.8	11.50		
79.9	102.4	11.28	2.355	26.553	717.64	84.6	107.2	11.30	2.355	26.612	719.23	81.0	103.7	11.33		
61.3	83.5	11.10	2.355	26.141	706.50	60.2	82.8	11.30	2.355	26.612	719.23	65.1	88.0	11.48		
64.7	87.5	11.40	2.355	26.847	725.59	52.8	75.4	11.28	2.355	26.553	717.64	51.5	73.7	11.10		
63.4	86.2	11.40	2.355	26.847	725.59	53.7	76.0	11.18	2.355	26.317	711.27	53.0	75.3	11.15		

K	Cam.	Const	Cam.	Ln.	Cam.	135°Δ	D'	D"	Radius	K	Cam.	Const	Cam.	Ln.
2.355	26.612		719.23			74.3	96.8	11.23	2.355	26.43		714.46		
2.355	25.670		693.77			68.7	91.6	11.45	2.355	26.96		728.78		
2.355	26.670		720.82			69.7	92.5	11.40	2.355	26.85		725.59		
2.355	26.612		719.23			84.6	107.2	11.30	2.355	26.61		719.23		
2.355	26.553		717.64			66.5	89.0	11.28	2.355	26.55		717.64		
2.355	26.612		719.23			82.6	105.2	11.30	2.355	26.61		719.23		
2.355	26.670		720.82			65.4	87.9	11.28	2.355	26.55		717.64		
2.355	26.729		722.41			76.8	99.5	11.38	2.355	26.79		724.00		
2.355	26.788		724.00			61.3	84.1	11.40	2.355	26.85		725.59		
2.355	26.729		722.41			75.9	98.6	11.38	2.355	26.79		724.00		
2.355	26.729		722.41			76.5	99.3	11.40	2.355	26.85		725.59		
2.355	27.024		730.37			70.9	93.9	11.48	2.355	27.02		730.37		
2.355	26.788		724.00			70.6	93.4	11.38	2.355	26.79		724.00		
2.355	26.612		719.23			74.5	97.0	11.25	2.355	26.49		716.05		
2.355	26.788		724.00			62.6	85.4	11.40	2.355	26.85		725.59		
2.355	26.612		719.23			70.6	93.3	11.33	2.355	26.67		720.82		
2.355	26.788		724.00			73.5	96.3	11.40	2.355	26.85		725.59		
2.355	26.729		722.41			73.0	95.8	11.38	2.355	26.79		724.00		
2.355	26.670		720.82			66.5	89.2	11.33	2.355	26.67		720.82		
2.355	26.612		719.23			69.3	92.0	11.35	2.355	26.73		722.41		
2.355	26.553		717.64			63.4	86.1	11.35	2.355	26.73		722.41		
2.355	26.729		722.41			73.3	96.9	11.80	2.355	27.79		751.05		
2.355	26.670		720.82			61.9	84.7	11.43	2.355	26.91		727.19		
2.355	26.741		722.73			74.9	97.5	11.30	2.355	26.61		719.23		
2.355	26.847		725.59			74.9	97.5	11.30	2.355	26.61		719.23		
2.355	26.258		709.68			76.9	99.3	11.18	2.355	26.32		711.27		
2.355	26.376		712.86			78.4	100.6	11.10	2.355	26.14		706.50		
2.355	26.729		722.41			76.2	98.9	11.35	2.355	26.73		722.41		
2.355	26.612		719.23			73.9	96.4	11.23	2.355	26.43		714.46		
2.355	26.670		720.82			61.1	83.7	11.33	2.355	26.67		720.82		
2.355	26.906		727.19			72.5	95.4	11.43	2.355	26.91		727.19		
2.355	27.200		735.14			73.1	95.9	11.40	2.355	26.85		725.59		
2.355	26.494		716.05			83.4	105.9	11.28	2.355	26.55		717.64		
2.355	26.612		719.23			58.8	81.4	11.33	2.355	26.67		720.82		
2.355	26.729		722.41			67.5	90.4	11.43	2.355	26.91		727.19		
2.355	27.083		731.96			81.1	104.0	11.45	2.355	26.96		728.78		
2.355	26.965		728.78			85.2	108.1	11.45	2.355	26.96		728.78		
2.355	26.965		728.78			83.2	106.0	11.43	2.355	26.91		727.19		
2.355	27.083		731.96			80.3	103.3	11.50	2.355	27.08		731.96		
2.355	26.670		720.82			71.2	93.8	11.33	2.355	26.67		720.82		
2.355	27.024		730.37			73.3	95.9	11.28	2.355	26.55		717.64		
2.355	26.141		706.50			60.8	83.4	11.30	2.355	26.61		719.23		
2.355	26.258		709.68			63.3	86.0	11.38	2.355	26.79		724.00		

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Crocidolite Standard
4/14/05
EDS# 16007

WINEDS



Title: Croc Std. 04-14-05 SP 16007

Quantitative Analysis Results - Standardless Analysis :
Croc Std. 04-14-05 SP 16007 Thu, Apr 14 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 4.56
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Na	3.70	Na ₂ O	4.87	0.71	4.87
Mg	1.43	MgO	2.45	0.44	2.45
Si	20.84	SiO ₂	53.23	1.27	53.23
Fe	11.62	Fe ₂ O ₃	39.45	1.33	39.45
<Total>	100.00		100.00		100.00

Na Crocidolite Std. Calibration

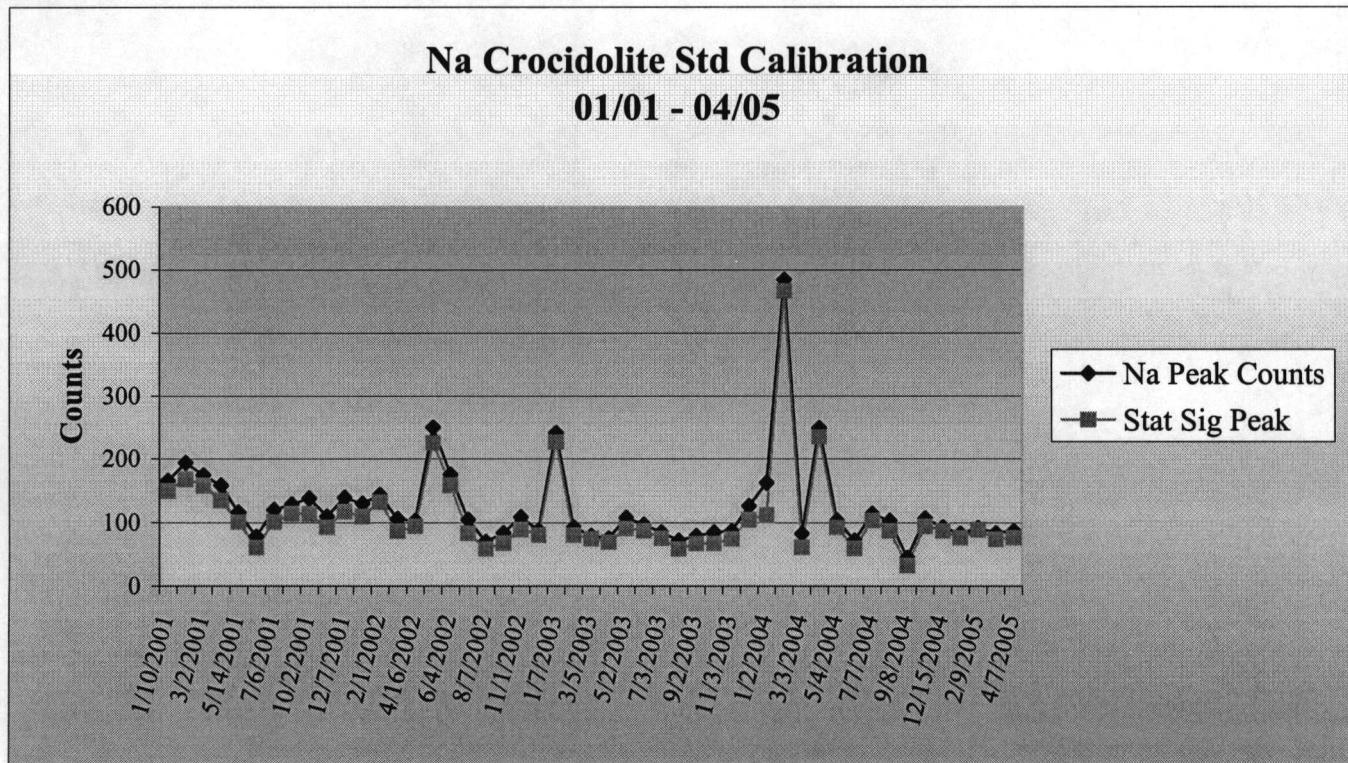
Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
1/10/2001	DW	9707	y	165	67	149.5	Pass
2/2/2001	DW	9753	y	193	71	167.5	Pass
3/2/2001	DW	9819	y	174	71	158	Pass
4/4/2001	DW	10012	y	158	56	135	Pass
5/14/2001	DW	10325	y	116	43	101	Pass
6/8/2001	DW	10405	y	78	22	61	Pass
7/6/2001	DW	10481	y	120	41	101	Pass
8/1/2001	DW	10631	y	129	50	114.5	Pass
10/2/2001	DW	10850	y	138	45	114	Pass
11/2/2001	DW	10966	y	110	38	93	Pass
12/7/2001	DW	11054	y	139	48	117.5	Pass
1/2/2002	DW	11121	y	130	45	110	Pass
2/1/2002	DW	11206	y	143	61	132.5	Pass
3/1/2002	DW	11272	y	106	34	87	Pass
4/16/2002	DW	11373	y	103	43	94.5	Pass
5/2/2002	DW	11465	y	250	100	225	Pass
6/4/2002	DW	11530	y	175	71	158.5	Pass
7/1/2002	DW	11799	y	105	31	83.5	Pass
8/7/2002	DW	12319	y	70	24	59	Pass
10/12/2002	DW	12633	y	84	26	68	Pass
11/1/2002	DW	12668	y	109	35	89.5	Pass
12/1/2002	DW	12779	y	88	37	81	Pass
1/7/2003	DW	13008	y	241	106	226.5	Pass
2/7/2003	KM	13078	y	93	34	80.5	Pass
3/5/2003	KM	13164	y	79	35	74.5	Pass
4/3/2003	KM	13225	y	75	32	69.5	Pass
5/2/2003	KM	13340	y	108	37	91	Pass
6/1/2003	KM	13436	y	97	39	87.5	Pass
7/3/2003	KM	13579	y	85	33	75.5	Pass
8/5/2003	KM	13712	y	72	23	59	Pass
9/2/2003	KM	13827	y	79	28	67.5	Pass
10/1/2003	KM	13979	y	85	25	67.5	Pass
11/3/2003	KM	14046	y	87	31	74.5	Pass
12/3/2003	KM	14130	y	126	42	105	Pass
1/2/2004	KM	14176	y	162	31	112	Pass
2/2/2004	KM	14239	y	484	224	466	Pass

3/3/2004	KM	14284	y	83	20	61.5	Pass
4/1/2004	KM	14370	y	249	110	234.5	Pass
5/4/2004	KM	14538	y	104	41	93	Pass
6/8/2004	KM	14818	y	72	24	60	Pass
7/7/2004	DW	14868	Y	114	47	104	Pass
8/3/2004	DW	14932	Y	103	36	87.5	Pass
9/8/2004	KM	15031	Y	45	10	32.5	Pass
11/1/2004	KM	15277	Y	107	41	94.5	Pass
12/15/2004	MQ	15568	Y	93	41	87.5	Pass
1/1/2005	KM	15628	Y	83	35	76.5	Pass
2/9/2005	DW	15915	Y	92	43	89	Pass
3/18/2005	DW	15914	Y	84	32	74	Pass
4/7/2005	MQ	16007	Y	87	33	76.5	Pass

*ND - Not Done

** Peak count is the maximum Na peak count

***Background peak count is the base, right of the Na peak



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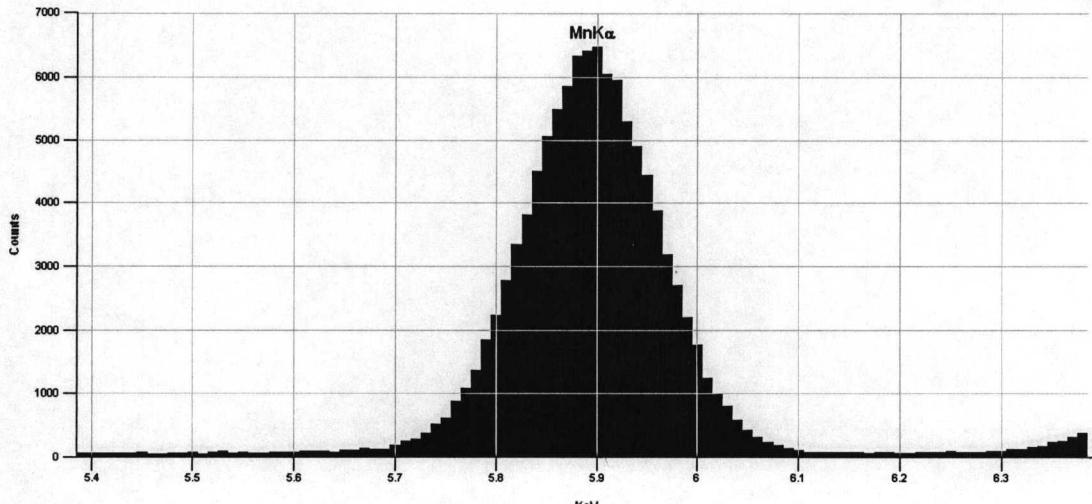
A Professional Service Corporation in the Northwest

Mn Standard

4/14/05

EDS# 16039

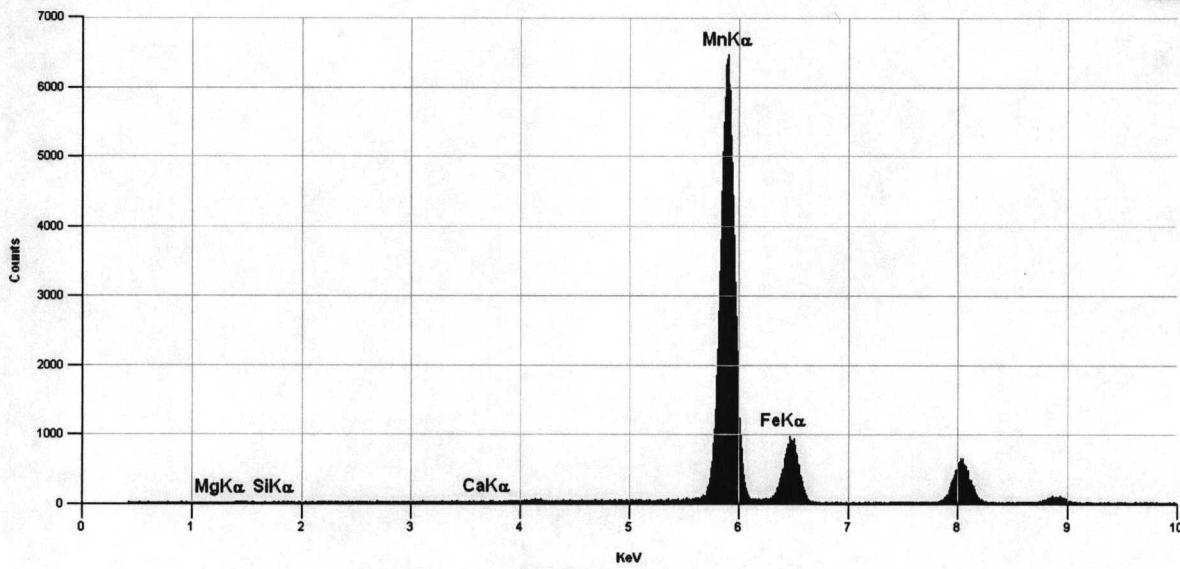
WINEDS



Peak Statistics : Spectrum1

Peak	Energy	Height	FWHM	Area
1	5.894	6188	151	99802
2	6.484	883	162	15269
3	8.037	599	168	10756

WINEDS



PHILIPS MnKa Peak Resolution Calibration

Date	Analyst	EDS	Mn Peak	FWHM High	FWHM Low	FWHM	# Channels	Resolution	Std Dev	Std Dev (2s)	Pass/Fail
			(cnts)	(cnts)*	(cnts)*	(cnts)*		(eV)			
2/5/02	DW		14255	7466	6369	6918	17	170			Pass
2/13/02	DW		10830	5441	4460	4951	17	170			Pass
2/26/02	DW		10070	5734	4772	5253	16	160			Pass
3/1/02	DW		10243	5177	4378	4778	15	150			Pass
3/20/02	DW		7684	3964	3290	3627	16	160			Pass
4/16/02	DW		10042	5693	4729	5211	16	160			Pass
5/2/02	DW	11466	10022	5310	4438	4874	17	170			Pass
6/4/02	DW	11531	10252	5421	4480	4951	16	160			Pass
7/1/02	DW	11800	10300	5749	4799	5274	16	160			Pass
8/7/02	DW	12318	10640	5905	4825	5365	17	170			Pass
10/1/02	DW	12634	15662	8414	7183	7799	17	170			Pass
11/1/02	DW	12667	20000	10797	9338	10068	17	170			Pass
12/2/02	DW	12778	10303	5421	4410	4916	16	160			Pass
1/7/03	DW	13007	10303	5569	4559	5064	14	140			Pass
2/7/03	KM	13089	10427	5960	4156	5058	17	170			Pass
3/5/2003	KM	13165	2348	1046	1279	1163	17	170			Pass
4/3/2003	KM	13226	10313	5676	4731	5204	16	160			Pass
5/5/2003	KM	13341	11454	5815	4977	5396	17	170			Pass
6/1/2003	KM	13437	9806	5385	4577	4981	17	170			Pass
7/3/2003	KM	13580	10335	5440	4620	5030	17	170			Pass
8/5/2003	KM	13713	10233	5686	4710	5198	17	170			Pass
9/2/2003	KM	13828	12311	6552	5661	6107	17	170			Pass
10/1/2003	KM	13981	10934	6341	5440	5891	17	170			Pass
11/3/2003	KM	14047	12783	7599	6376	6988	17	170	3.162	6.325	Pass
12/3/2003	KM	14131	10314	5258	4476	4867	17	170	3.162	6.325	Pass
1/2/2004	KM	14175	9901	5102	4166	4634	17	170	3.162	6.325	Pass
2/2/2004	KM	14240	10370	4747	5732	5240	17	170	0.000	0.000	Pass
3/3/2004	KM	14285	10232	5374	4428	4901	16	160	3.162	6.325	Pass
4/1/2004	KM	14371	9603	5532	4718	5125	17	170	3.162	6.325	Pass
5/4/2004	KM	14542	10344	4743	4017	4380	17	170	3.162	6.325	Pass
6/8/2004	KM	14819	10084	5420	4601	5011	17	170	3.162	6.325	Pass
7/7/2004	DW	14868	12292	5971	5843	5907	16	160	4.216	8.433	Pass
9/8/2004	KM	15032	6799	4180	3197	3689	16	160	4.830	9.661	Pass
11/1/2004	KM	15278	10251	6145	5244	5695	16	160	4.924	9.847	Pass
12/15/2004	DW	15566	10227	5288	4330	4809	17	170	4.924	9.847	Pass
1/6/2005	DW	15917	3665	1451	1768	1610	16	160	5.149	10.299	Pass
2/9/2005	KM						16	160	5.222	10.445	Pass
3/18/2005	DW	15916	10784	4630	5736	5183	16	160	5.189	10.377	Pass
4/14/2005	KM	16038	6471				15.1	151	6.135	12.270	Pass

* Data is historical for the most recent 12 months

(cnts)* These counts are no longer necessary as the WinEDS program calculates the FWHM automatically.

Lab/Cor, Inc.

Equipment Maintenance Form

Equipment: Philips 410LS Transmission Electron Microscope

Serial Number: D673

Installation Date: Nov. 1990 **Month:** March 2005

Version# 1

Scheduled Maintenance

	1	2	3	4	5	6	7	8	9	10	11
Daily	KM	KM	MQ	DW		KM	DW	DW	DW	DW	DW
Weekly						KM					DW
Monthly						TM					DW
Quarterly											DW
Yearly											
	12	13	14	15	16	17	18	19	20	21	22
Daily		MQ	DW	KM	DW		DW			DW	DW
Weekly			DW								
Monthly			DW								
Quarterly											
Yearly											
	23	24	25	26	27	28	29	30	31		
Daily	KM	DW	MQ	TM		DW	DW	DW			
Weekly											
Monthly											
Quarterly											
Yearly											

Daily: Check for water/ air leaks. Check for vacuum leaks. Grease the specimen rod O' ring lightly. Daily scope alignment.

Weekly: Drain air compressor tank. Check blow-off line for presence of water (behind microscope column). Press valve at the bottom of glass bulb to expel any residual water in air lines.

Monthly: Check oil level and color in rotary pump in housing behind scope. If level is below the 'fill' mark, add Hydrocarbon based oil only (NO SILICON OIL).

Quarterly: Clean water line filter when water chiller tank and filter are cleaned.

Yearly: Have scope serviced as part of preventative maintenance.

Observations: 3/10/05 - Filament replaced - 
3/11/05 - Filament replaced - 

Montl Claibration Log

Lab/Cor, Inc.

Date: March 2005

Analyst	KM	KM	MQ	DIN	TM	DW	DW	DW	DIN	DIN/KA		MQ		KM	DIN	
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18K Mag. Calib. SC1																19.2
SC2																19.2
SC3																19.2
SC4																19.2
SC5																19.3
10K Mag. Calibration																34.3
EDS																
EDS Na																
EDS Al																1-480
Gain Inc.																10.005
New Gain																
Cu																8.040
Zero Inc.																
New Zero																
Resolution																155.224
# of Iterations																
Alignment -- FCA	✓		✓			✓	✓	✓			✓					
DA	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gold Rings Negative																
Camera Constant																
Analyst	DW			DW	DW	KM	DW	MQ	TM	DW	DW	DW	DW	DW	DW	DW
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
18K Mag. Calib. SC1																
SC2																
SC3																
SC4																
SC5																
10K Mag. Calibration																
EDS																
EDS Na																
EDS Al																
Gain Inc.																
New Gain																
Cu																
Zero Inc.																
New Zero																
Resolution																
# of Iterations																
Alignment -- FCA	✓				✓											
DA	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gold Rings Negative	✓				✓											
Camera Constant																

Lab/Cor, Inc.

Equipment Maintenance Form

Equipment: Philips 410LS Transmission Electron Microscope

Serial Number: D673

Installation Date: Nov. 1990

Month: APRIL 2005

Version# 1

Scheduled Maintenance

	1	2	3	4	5	6	7	8	9	10	11
Daily			DW	PW	DW	DW		DN			
Weekly								X			
Monthly								A			
Quarterly											
Yearly											
	12	13	14	15	16	17	18	19	20	21	22
Daily	DW		DW								
Weekly											
Monthly											
Quarterly											
Yearly											
	23	24	25	26	27	28	29	30	31		
Daily											
Weekly											
Monthly											
Quarterly											
Yearly											

Daily: Check for water/ air leaks. Check for vacuum leaks. Grease the specimen rod O' ring lightly. Daily scope alignment.

Weekly: Drain air compressor tank. Check blow-off line for presence of water (behind microscope column). Press valve at the bottom of glass bulb to expel any residual water in air lines.

Monthly: Check oil level and color in rotary pump in housing behind scope. If level is below the 'fill' mark, add Hydrocarbon based oil only (NO SILICON OIL).

Quarterly: Clean water line filter when water chiller tank and filter are cleaned.

Yearly: Have scope serviced as part of preventative maintenance.

Observations:

Montl Calibration Log

Lab/Cor, Inc.

Date: Jan 8th

Analyst	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18K Mag. Calib. SC1									19.2								
SC2									19.2								
SC3									19.1								
SC4									19.2								
SC5									19.1								
10K Mag. Calibration									37.8								
EDS																	
EDS Na										MG2							
EDS Al																	
Gain Inc.																	
New Gain																	
Cu																	
Zero Inc.																	
New Zero																	
Resolution																	
# of Iterations																	
Alignment -- FCA																	
DA																	
Gold Rings Negative																	
Camera Constant																	
Analyst																	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
18K Mag. Calib. SC1																	
SC2																	
SC3																	
SC4																	
SC5																	
10K Mag. Calibration																	
EDS																	
EDS Na																	
EDS Al																	
Gain Inc.																	
New Gain																	
Cu																	
Zero Inc.																	
New Zero																	
Resolution																	
# of Iterations																	
Alignment -- FCA																	
DA																	
Gold Rings Negative																	
Camera Constant																	

Screen and Camera Magnification Calibration

Version#3

Date of Measurement: 4/13/2005 **Analyst:** MP

Setting: 20,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/7/2005	1586	51.65	110.85	59.2	7	18267
Screen		SM1 22.1	SM2 22.1	SM3 22	SM4 22	SM5 22.2
Date	# Spaces	Magnification				
4/7/2005	22.08	15652				

Setting: 10,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/7/2005	1587	32.85	104.45	71.6	16	9666
Screen		SM1 43.9	SM2 44	SM3 43.9	SM4 44	SM5 43.8
Date	# Spaces	Magnification				
4/7/2005	43.92	7869				

Setting: 5,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
4/7/2005	1588	42.35	97.45	55.1	25	4761

D₁ = The smaller measurement of the Supper Device in mm.

D₂ = The larger measurement of the Supper Device in mm.

D = D₂ - D₁

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

Screen Magnification Calibration (Jeol 1200)

(Version#1)

Date of Measurement: 4/7/2005

Analyst: KM

Average:

Screen Magnification at 18,000:	15652
Screen Magnification at 10,000:	7869

Setting 20,000

	SM1	SM2	SM3	SM4	SM5	
Screen	22.1	22.1	22	22	22.2	
	Date	# Spaces		Magnification		
	4/7/2005	22.08		15652		

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
4/7/2005	5.11	4.44	0.064	0.639

Setting 10,000

	SM1	SM2	SM3	SM4	SM5	
Screen	43.9	44	43.9	44	43.8	
	Date	# Spaces		Magnification		
	4/7/2005	43.92		7869		

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
4/7/2005	10.17	8.00	0.127	1.271

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

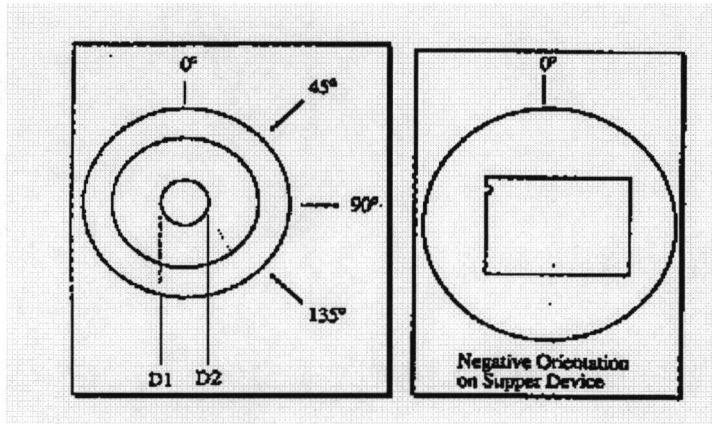
Screen Magnification = $(160/\# \text{ spaces}) * 2160$

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	4/14/2005	Average Camera Constant:	29.832 mmA
Negative Number:	J1568	(All 12 Measurements)	
Date Negative was Taken:	4/7/2005	Average Camera Length:	806.27 mm
Analyst:	km	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	77.30	102.70	25.40	12.70	29.91	808.34	78.75	104.00	25.25	12.63	29.73	803.56
2	75.65	104.90	29.25	14.63	29.82	805.96	77.15	106.50	29.35	14.68	29.92	808.71
3	69.40	110.75	41.35	20.68	29.81	805.77	70.90	112.40	41.50	20.75	29.92	808.69

Ring #	90 degrees						135 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	77.55	102.85	25.30	12.65	29.79	805.16	69.00	94.30	25.30	12.65	29.79	805.16
2	75.50	104.95	29.45	14.73	30.02	811.47	66.75	95.85	29.10	14.55	29.67	801.82
3	69.65	111.20	41.55	20.78	29.96	809.66	61.30	102.40	41.10	20.55	29.63	800.89



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D₁ = The smaller measurement on the Supper device (mm).

D₂ = The larger measurement on the Supper device (mm).

$$D = D_2 - D_1$$

$$R = D/2$$

CC = Camera Constant

For Ring 1 [111], CC = R*2.355

For Ring 2 [200], CC = R*2.039

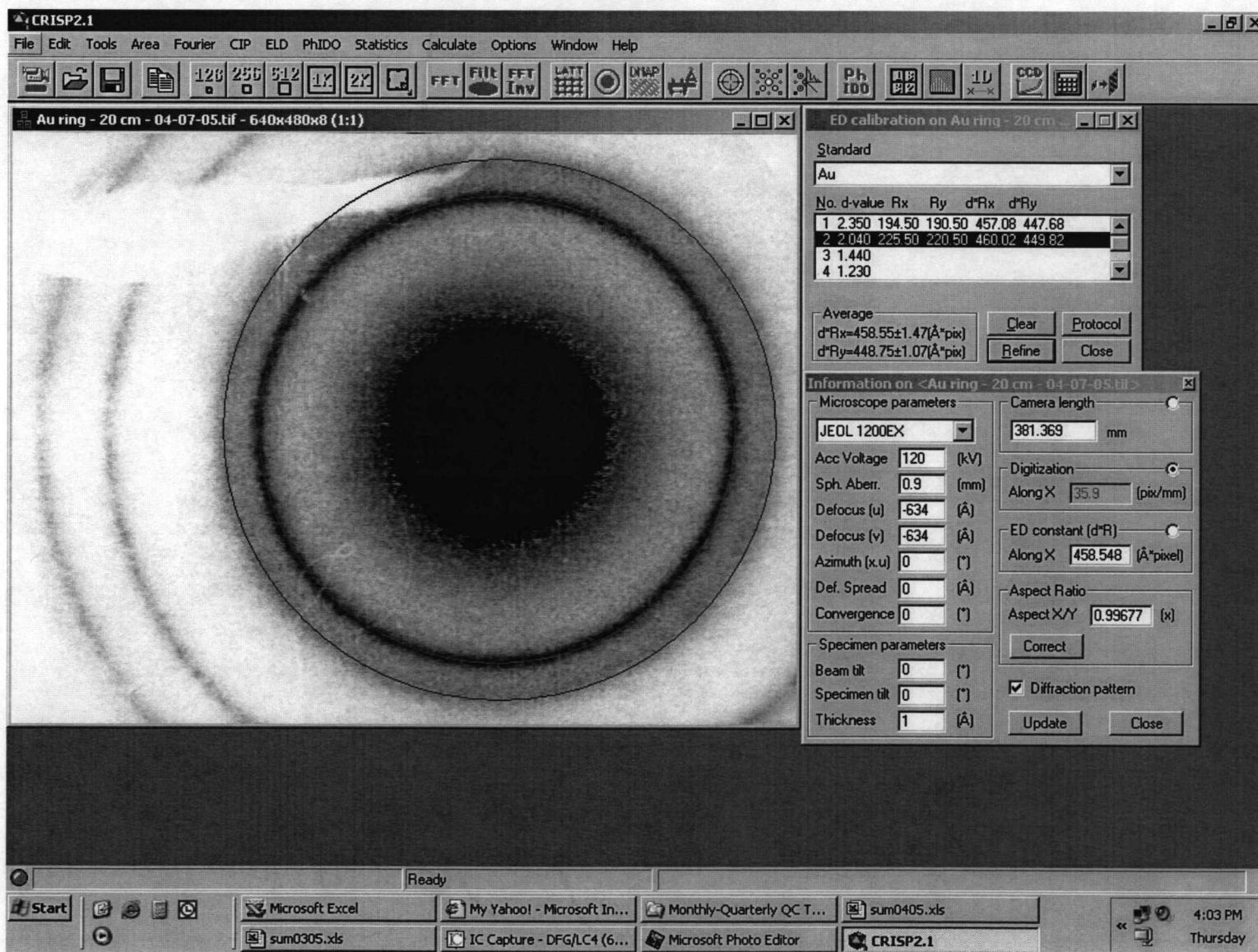
For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Au Std 04-07-05
Jeol 1200 EX Gatan Image
20 cm

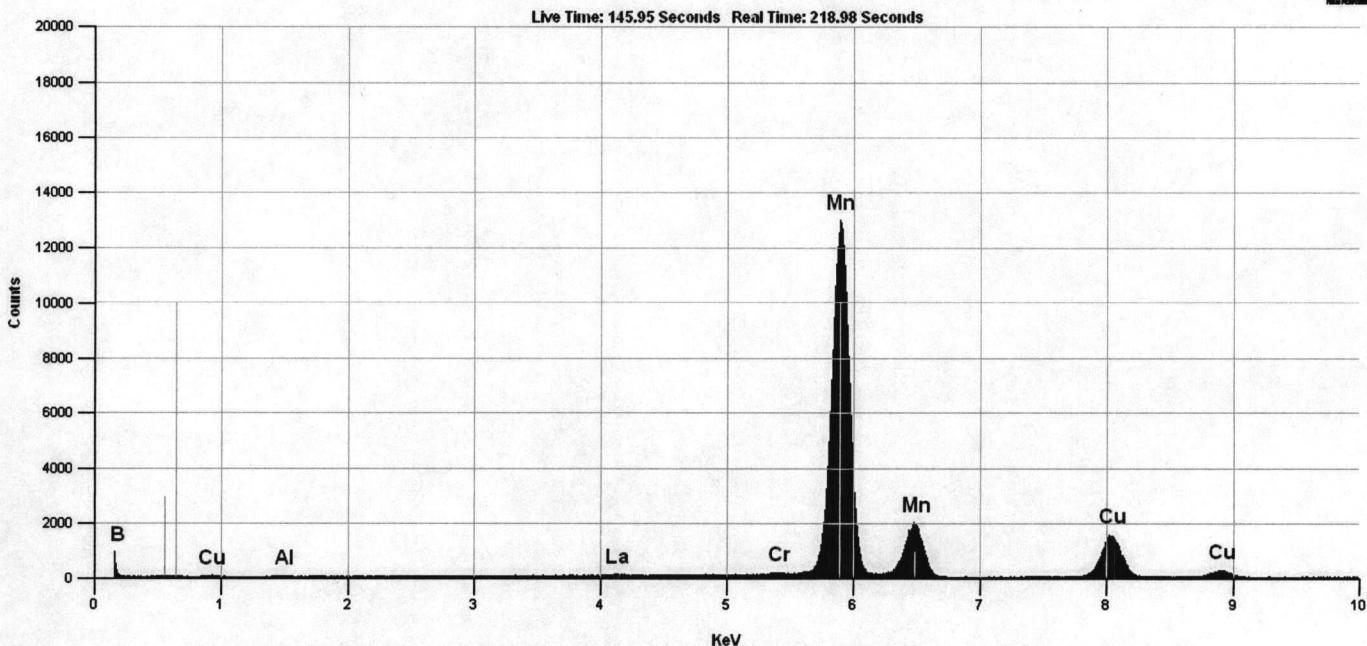


Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Manganese Standard

04-07-05
Jeol 1200 EX

WINEDS



Title: Mn Standard 4-07-05 SP 1220 Time: 5:43:52 PM Date: Thu, Apr 07 2005 Accelerating Voltage: 100 KV Take Off Angle: 35 Degrees

Quantitative Analysis Results - Standardless Analysis :
Mn Standard 4-07-05 SP 1220 Thu, Apr 07 2005
EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 1.15
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Al	0.06	Al ₂ O ₃	0.09	0.02	0.09
Mn	49.93	MnO	99.91	0.67	99.91
<Total>	100.00		100.00		100.00

Peak List
Peak Statistics : Spectrum8

Peak	Energy	Height	FWHM	Area
1	5.894	12685	159	215417
2	6.485	1871	165	33058
3	8.037	1502	175	28120

JEOL MnKa Peak Resolution Calibration

Date	Analyst	EDS	# Channels	Resolution (eV)	Std Dev	Std Dev (2s)	Pass/Fail
4/5/2004	JH		11				
7/14/2004	KM	380	14	140			Pass
9/18/2004	JH	506	13.9	139	0.707	1.4142136	Pass
11/1/2004	JH	705	14.1	141	1.000	2	Pass
12/16/2004	JH	864	14.1	141	0.957	1.9148542	Pass
1/21/2005	JH	984	16.4	164	10.654	21.307276	Fail
2/10/2005	JH	1035	13.9	139	9.839	19.677398	Pass
3/17/2005	KM	1165	14.4	144	8.981	17.962925	Pass
4/7/2005	km	1220	15.9	159	10.339	20.678952	Pass

**Service Technician called to
recalibrate EDS system.

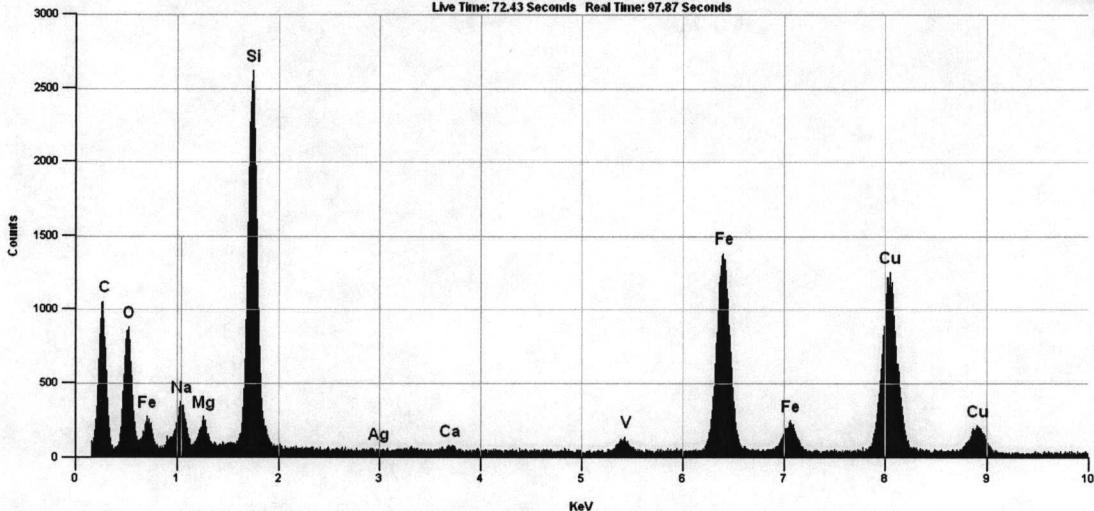
Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Crocidolite Standard

04-07-05

Jeol 1200 EX

WINEDS



TITLE: Croc Std 4/7/05 SP 1219 Time: 5:31:01 PM Date: Thu, Apr 07 2005 Accelerating Voltage: 100 KV Take Off Angle: 35 Degrees

Quantitative Analysis Results - Standardless Analysis :

Croc Std 4/7/05 SP 1219 Thu, Apr 07 2005

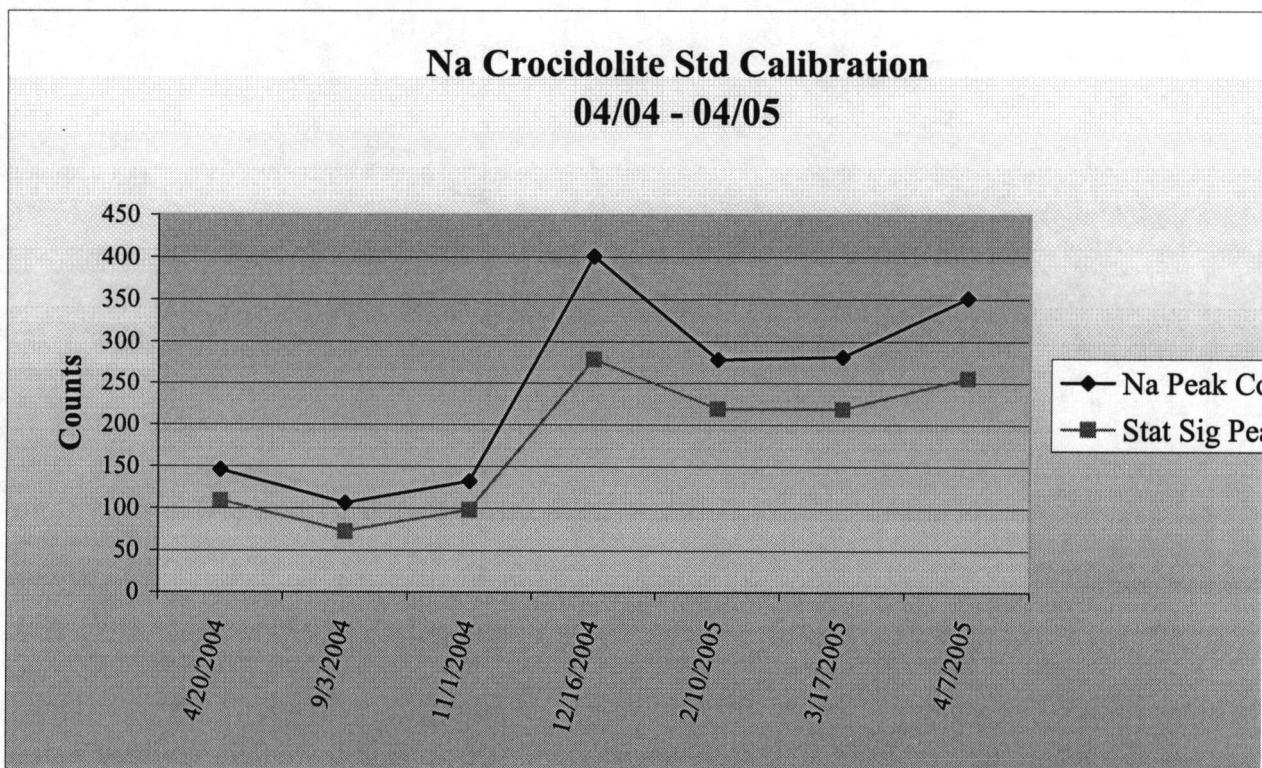
EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 161.36

Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Na	3.15	Na ₂ O	4.19	0.23	4.19
Mg	1.57	MgO	2.71	0.20	2.71
Si	21.56	SiO ₂	55.55	0.78	55.55
Ca	0.18	CaO	0.43	0.16	0.43
Fe	10.84	. Fe ₂ O ₃	37.11	0.94	37.11
<Total>		100.00	100.00		100.00

Na Crocidolite Std. Calibration

Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
4/20/2004	JH	90	5.0 x 0.3	146	36	109	Pass
9/3/2004	KM	484		106	19	72	Pass
11/1/2004	JH	704		132	32	98	Pass
12/16/2004	JH	863		401	78	278.5	Pass
2/10/2005	JH	1034	13 x 0.25	278	80	219	Pass
3/17/2005	KM	1164		281	78	218.5	Pass
4/7/2005	KM	1219	55 x 0.8	351	80	255.5	Pass



JEOL 1200EX

EDS Resolution Calibration (Version#1)

Month: MAR 2005

Analyst	JH	KM		JH	JH		JH/KM	KM	JH	JH	JH	JH	KM	KM	NH	
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18K Mag. Calib. SC1																
SC2																
SC3																
SC4																
SC5																
10K Mag. Calibration																
EDS																
EDS Na																
EDS Al																
Gain Inc.																
New Gain																
Cu																
Zero Inc.																
New Zero																
Resolution																
# of Iterations																
Alignment --	FCA	✓			✓					✓						
	DA	✓	✓		✓	✓				✓						
Gold Rings Negative	✓				✓					✓						
Camera Constant																
Analyst	JH	JH	KM	KM	JH	KM	JH	JH	JH	JH			KM	KM	JH	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30		31
18K Mag. Calib. SC1																
SC2																
SC3																
SC4																
SC5																
10K Mag. Calibration																
EDS																
EDS Na																
EDS Al																
Gain Inc.																
New Gain																
Cu																
Zero Inc.																
New Zero																
Resolution																
# of Iterations								✗								
Alignment --	FCA							✓								
	DA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Gold Rings Negative							✓									
Camera Constant																

EDS Resolution Calibration (Version#1)

Month: APRIL 2005

Analyst	JH	KW			JH	JH	JH	JH	JH	JM						
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18K Mag. Calib. SC1																
SC2																
SC3																
SC4																
SC5																
10K Mag. Calibration																
EDS																
EDS Na																
EDS Al																
Gain Inc.																
New Gain																
Cu																
Zero Inc.																
New Zero																
Resolution																
# of Iterations																
Alignment -- FCA									✓							
DA	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓				
Gold Rings Negative								✓								
Camera Constant																
Analyst																
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
18K Mag. Calib. SC1																
SC2																
SC3																
SC4																
SC5																
10K Mag. Calibration																
EDS																
EDS Na																
EDS Al																
Gain Inc.																
New Gain																
Cu																
Zero Inc.																
New Zero														
Resolution																
# of Iterations																
Alignment -- FCA																
DA																
Gold Rings Negative																
Camera Constant																

Lab/Cor, Inc.

Equipment Maintenance Form

Equipment: JEOL-1200EX Transmission Electron Microscope

Serial Number: EM157003

Installation Date: Aug. 03

Month: MARCH 2005

Version# 1

Scheduled Maintenance

	1	2	3	4	5	6	7	8	9	10	11
Daily	KM/JH		KM	JH	JH			JH/KM	KH	JH	JH
Weekly	KM							KM			
Monthly											
Quarterly											
Yearly											
	12	13	14	15	16	17	18	19	20	21	22
Daily		KM	KM		JH	JH	JH	KM	KM	JH	KM
Weekly											KM
Monthly											KM
Quarterly											KM
Yearly											
	23	24	25	26	27	28	29	30	31		
Daily	JH	JH	JH				KM	KM			
Weekly			JH								
Monthly											
Quarterly											
Yearly											

Daily: Check for water/ air leaks. Check for vacuum leaks. Grease the specimen rod O' ring lightly. Daily scope alignment.

Weekly: Check water level of chiller and pressure reading.

Monthly: Check oil level and color in rotary pump in housing behind scope. If level is below the 'fill' mark, add Hydrocarbon based oil only (NO SILICON OIL).

Quarterly: Clean water line filter when water chiller tank and filter and cleaned.

Yearly: Have scope serviced as part of preventative maintenance.

Observations:

Lab/Cor, Inc.

Equipment Maintenance Form

Equipment: JEOL-1200EX Transmission Electron Microscope

Serial Number: EM157003

Installation Date: Aug. 03

Month: APRIL 2005

Version# 1

Scheduled Maintenance

	1	2	3	4	5	6	7	8	9	10	11
Daily	JH			JH	km	JH	JL	JH			
Weekly				JH							
Monthly											
Quarterly											
Yearly											
	12	13	14	15	16	17	18	19	20	21	22
Daily											
Weekly											
Monthly											
Quarterly											
Yearly											
	23	24	25	26	27	28	29	30	31		
Daily											
Weekly											
Monthly											
Quarterly											
Yearly											

Daily: Check for water/ air leaks. Check for vacuum leaks. Grease the specimen rod O' ring lightly. Daily scope alignment.

Weekly: Check water level of chiller and pressure reading.

Monthly: Check oil level and color in rotary pump in housing behind scope. If level is below the 'fill' mark, add Hydrocarbon based oil only (NO SILICON OIL).

Quarterly: Clean water line filter when water chiller tank and filter and cleaned.

Yearly: Have scope serviced as part of preventative maintenance.

Observations:

LabCor, Inc.
A Professional Service Corporation in the Northwest

Indirect Sample Prep Log

Samples	Ash Tech	Ash date	Ash time	Hydrolyzed Date	Hydrolyzed Time	Prep Date	Prep Tech	Rejection	Re-prep Date	Prep Tech	Prep Method Change
041172-01	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041172-02	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041172-11	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041188-02								Filter Blown Out			
041188-03	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041188-05	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041188-06	MH	1/7/2005	15:30	1/7/2005	18:30	1/21/2005	MH				
041188-07	MH	1/7/2005	18:00	1/7/2005	21:00	1/21/2005	MH				
041188-08	MH	1/7/2005	18:00	1/7/2005	21:00	1/21/2005	MH				
041188-09	MH	1/7/2005	18:00	1/7/2005	21:00	1/28/2005	MH				
041188-12	MH	1/7/2005	18:00	1/7/2005	21:00	1/28/2005	MH				
041188-15	MH	1/7/2005	18:00	1/7/2005	21:00	1/28/2005	MH				
041188-16								Filter Blown Out			
041188-19	MH	1/7/2005	18:00	1/7/2005	21:00	1/28/2005	MH				
041188-20	MH	1/10/2005	15:20	1/10/2005	18:20	1/28/2005	MH				
041188-25	MH	1/10/2005	15:20	1/10/2005	18:20	1/28/2005	MH				
041188-27	MH	1/10/2005	15:20	1/10/2005	18:20	1/28/2005	MH				
041188-31	MH	1/10/2005	15:20	1/10/2005	18:20	1/28/2005	MH				
041188-37	MH	1/10/2005	15:20	1/10/2005	18:20	1/28/2005	MH				
041188-39	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-40	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-43	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-44	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-45	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-46	MH	1/10/2005	17:50	1/10/2005	20:50	2/10/2005	MH				
041188-47	MH	1/11/2005	15:25	1/11/2005	18:25	2/10/2005	MH				

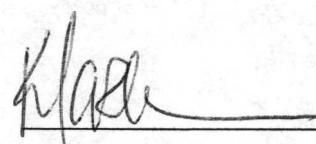
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Samples	Ash Tech	Ash date	Ash time	Hydrolyzed Date	Hydrolyzed Time	Prep Date	Prep Tech	Rejection	Re-prep Date	Prep Tech	Prep Method Change
041188-48	MH	1/11/2005	15:25	1/11/2005	18:25	2/10/2005	MH				
041188-49	MH	1/11/2005	15:25	1/11/2005	18:25	2/10/2005	MH				
041188-89								Filter Blown Out			
041188-101	MH	1/11/2005	15:25	1/11/2005	18:25	2/10/2005	MH				
041188-103	MH	1/11/2005	15:25	1/11/2005	18:25	2/10/2005	MH				
041188-111	MH	1/11/2005	15:25	1/11/2005	18:25	3/22/2005	MH				
041191-04	MH	1/11/2005	18:10	1/11/2005	21:10	3/22/2005	MH				
041191-05	MH	1/11/2005	18:10	1/11/2005	21:10				3/22/2005	MH	Ashed for two hours
041191-06	MH	1/11/2005	18:10	1/11/2005	21:10				3/22/2005	MH	Ashed for two hours
041191-24	MH	1/11/2005	18:10	1/11/2005	21:10	3/22/2005	MH				
041191-26	MH	1/11/2005	18:10	1/11/2005	21:10	3/22/2005	MH				
041191-28	MH	1/11/2005	18:10	1/11/2005	21:10	3/16/2005	KM				
041191-29	MH	1/12/2005	15:40	1/12/2005	18:40	3/16/2005	KM				
041191-33	MH	1/12/2005	15:40	1/12/2005	18:40	3/16/2005	KM				
041191-34	MH	1/12/2005	15:40	1/12/2005	18:40	3/16/2005	KM				
041191-35	MH	1/12/2005	15:40	1/12/2005	18:40	3/16/2005	KM				
041191-36	MH	1/12/2005	15:40	1/12/2005	18:40	3/22/2005	MH				
041191-37	MH	1/12/2005	15:40	1/12/2005	18:40	3/22/2005	MH				
041191-39	MH	1/12/2005	18:30	1/12/2005	21:30	3/22/2005	MH				
041191-40	MH	1/12/2005	18:30	1/12/2005	21:30	3/22/2005	MH				
041191-49	MH	1/12/2005	18:30	1/12/2005	21:30	3/7/2005	MH				
041191-50	MH	1/12/2005	18:30	1/12/2005	21:30	3/7/2005	MH				
041191-51	MH	1/12/2005	18:30	1/12/2005	21:30	3/7/2005	MH				
041191-53	MH	1/12/2005	18:30	1/12/2005	21:30	3/7/2005	MH				
041191-54	MH	1/13/2005	15:30	1/13/2005	18:30	3/7/2005	MH				
041191-55	MH	1/13/2005	15:30	1/13/2005	18:30	3/7/2005	MH				
041191-56	MH	1/13/2005	15:30	1/13/2005	18:30	3/7/2005	MH				
041191-82	MH	1/13/2005	15:30	1/13/2005	18:30	3/22/2005	MH				
041191-87	MH	1/13/2005	15:30	1/13/2005	18:30	3/22/2005	MH				
041191-100								Hole in Filter			
041191-101								Hole in Filter			
041191-104								Hole in Filter			

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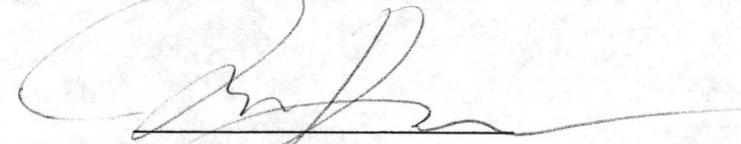
Samples	Ash Tech	Ash date	Ash time	Hydrolyzed Date	Hydrolyzed Time	Prep Date	Prep Tech	Rejection	Re-prep Date	Prep Tech	Prep Method Change
041191-108	MH	1/13/2005	15:30	1/13/2005	18:30	3/7/2005	MH				
041191-109	MH	1/13/2005	18:10	1/13/2005	21:10	3/7/2005	MH				
041191-112	MH	1/13/2005	18:10	1/13/2005	21:10	3/7/2005	MH				
041210-22								Filter Blown Out			
041188-98	MH	1/13/2005	18:10	1/13/2005	21:10	3/22/2005	MH				
041188-86	MH	1/13/2005	18:10	1/13/2005	21:10	3/22/2005	MH				
Lab Process Blank	MH	1/13/2005	18:10	1/13/2005	21:10	3/16/2005	MH				
041210-46	MH	1/21/2005	15:20	1/21/2005	18:40	3/22/2005	MH				
041210-47	MH	1/21/2005	15:20	1/21/2005	18:40	3/22/2005	MH				
041210-59	MH	3/22/2005	12:30	3/22/2005	15:40	3/22/2005	MH				Ashed for two hours
050580-02/03	MH	3/29/2005	15:20	3/30/2005	16:20	3/30/2005	MH				Ashed for two hours
050580-02/03	MH	3/29/2005	15:20	3/30/2005	16:20	3/30/2005	MH				Ashed for two hours
050580-07	MH	3/29/2005	15:20	3/30/2005	16:20	3/30/2005	MH				Ashed for two hours

QC Supervisor,



Kate March

QC Technician,



Minh Huynh

Lab/Cor, Inc.
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Indirect Sample Prep List

Prepped	Job #	L/C#	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution	Grids Needed
MH 1/21/05	041172	01	300.96	0.49	0.25	1.4	177.00	20	1:2	7
MH 1/21/05	041172	02	296.04	0.49	0.25	1	180.00	20	1:2	7
MH 1/21/05	041172	11	608.15	0.53	0.25	1.4	88.00	20	1:2	4
	041188	02	2343		Filter Blown Out					
MH 1/21/05	041188	03	902.5	0.5	0.25	2.2	59.00	20	1:2	3
MH 1/21/05	041188	05	893.84	0.6	0.25	2.2	60.00	20	1:2	3
MH 1/21/05	041188	06	908.8	0.6	0.25	3	59.00	20	1:2	3
MH 1/21/05	041188	07	900.33	0.65	0.25	2.7	118.00	10	1:4	5
MH 1/21/05	041188	08	2464.87	0.65	0.25	2.2	22.00	20	1:2	3
MH 1/28/05	041188	09	2465.37	0.45	0.25	3	43.00	10	1:4	3
MH 1/28/05	041188	12	903.74	0.7	0.25	2.1	59.00	20	1:2	3
MH 1/28/05	041188	15	605.59	0.65	0.25	1.3	88.00	20	1:2	4
MH 1/28/05	041188	16	586.2		Filter Blown Out					
MH 1/28/05	041188	19	311.64	0.7	0.25	1.4	171.00	20	1:2	7
MH 1/28/05	041188	20	308.4	0.75	0.5	1.2	173.00	10	1:2	7
MH 1/28/05	041188	25	625.58	0.65	0.25	1.2	85.00	20	1:2	4
MH 1/28/05	041188	27	626.25	0.7	0.25	1.9	85.00	20	1:2	4
MH 1/28/05	041188	31	315.25	0.75	0.5	1.2	169.00	10	1:2	7
MH 1/28/05	041188	37	598.92	0.6	0.25	1.3	89.00	20	1:2	4
MH 2/10/05	041188	39	299.11	0.89	0.5	2.8	237.00	7.5	1:3	9
MH 2/10/05	041188	40	306.25	0.89	0.5	1.4	174.00	10	1:2	7
MH 2/10/05	041188	43	312.54	0.89	0.5	2.2	170.00	10	1:2	7
MH 2/10/05	041188	44	307.46	0.89	0.5	1.8	173.00	10	1:2	7
MH 2/10/05	041188	45	302.04	0.89	0.5	1.3	176.00	10	1:2	7
MH 2/10/05	041188	47	309	0.89	0.5	1.5	172.00	10	1:2	7

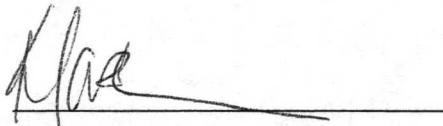
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Prepped	Job #	L/C#	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution	Grids Needed
MH 2/10/05	041188	48	312.72	0.48	0.25	1	170.00	20	1:2	7
MH 2/10/05	041188	49	294.96	0.72	0.25	1.3	181.00	20	1:2	8
MH 2/10/05	041188	86	1203.6	0.68	0.25	1.7	44.00	20	1:2	3
	041188	89	1199.52		Filter Blown Out					
MH 2/10/05	041188	98	1244.76	0.45	0.25	1.5	43.00	20	1:2	3
MH 2/10/05	041188	101	1215.88	0.89	0.5	3	88.00	5	1:4	4
MH 2/10/05	041188	103	1247.88	1	0.5	1.8	43.00	10	1:2	3
MH 3/22/05	041188	111	1148.05	1	0.5	1.4	46.00	10	1:2	3
MH 3/22/05	041191	04	893.16	0.75	0.5	1.9	60.00	10	1:2	3
MH 3/22/05	041191	05	920.52	0.75	0.25	2.5	77.00	15	1:3	4
MH 3/22/05	041191	06	904.68	0.75	0.25	2.4	79.00	15	1:3	4
MH 3/22/05	041191	24	582.92	0.75	0.5	2.3	91.00	10	1:2	5
MH 3/22/05	041191	26	598.5	0.75	0.5	1.1	89.00	10	1:2	4
KM 3-16-05	041191	28	306.24	0.75	0.5	2.4	174.00	10	1:2	7
KM 3-16-05	041191	29	305.4	0.75	0.5	2.7	174.00	10	1:2	7
KM 3-16-05	041191	33	300.96	0.75	0.5	1.3	177.00	10	1:2	7
KM 3-16-05	041191	34	305.28	0.75	0.5	3	233.00	7.5	1:3	9
KM 3-16-05	041191	35	301.44	0.75	0.5	2.4	177.00	10	1:2	7
MH 3/22/05	041191	36	878.04	0.75	0.5	2.2	61.00	10	1:2	4
MH 3/22/05	041191	37	903.6	0.75	0.5	2.6	79.00	7.5	1:3	4
MH 3/22/05	041191	39	929.16	0.75	0.5	2.2	57.00	10	1:2	3
MH 3/22/05	041191	40	928.08	0.75	0.5	2.5	57.00	10	1:2	3
MH 3/7/05	041191	49	307.56	0.75	0.5	2.7	231.00	7.5	1:3	9
MH 3/7/05	041191	50	303.72	0.75	0.5	2.4	175.00	10	1:2	7
MH 3/7/05	041191	51	296.76	0.75	0.5	2.8	239.00	7.5	1:3	9
MH 3/7/05	041191	53	303.72	0.75	0.5	3	234.00	7.5	1:3	9
MH 3/7/05	041191	54	309.24	0.75	0.5	2.1	172.00	10	1:2	7

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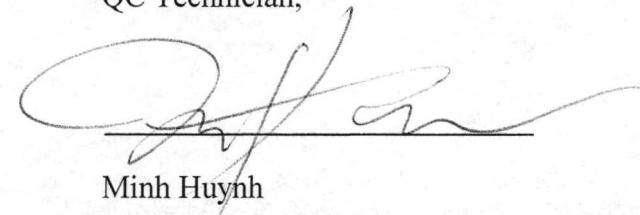
Prepped	Job #	L/C#	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution	Grids Needed
MH 3/7/05	041191	55	302.52	0.75	0.5	2.5	176.00	10	1:2	7
MH 3/7/05	041191	56	291.96	0.75	0.5	2.5	182.00	10	1:2	8
MH 3/22/05	041191	82	606.99	1	0.5	1.5	88.00	10	1:2	4
MH 3/22/05	041191	87	580.78	0.82	0.5	1.4	92.00	10	1:2	5
	041191	100	303.21	0.85	Rejected at Prep - About 1-2 mm hole in filter					
	041191	101	1231.2	0.89	Rejected at Prep - About 1-2 mm hole in filter					
	041191	104	1255.2	0.89	Rejected at Prep - Blue & White filter remnants from manufacturing under filter, causing redistribution of air flow over filter					
MH 3/7/05	041191	108	1258.8	0.89	0.5	2.8	56.00	7.5	1:3	3
MH 3/7/05	041191	109	1185.06	0.89	0.5	1.4	45.00	10	1:2	3
MH 3/7/05	041191	112	1243.2	0.89	0.5	2.1	43.00	10	1:2	3
	041210	22	6588.09		Filter Blown Out					
MH 3/22/05	041210	46	7200	0.8	0.25	3	49.00	10	1:4	3
MH 3/22/05	041210	47	7072.96	0.8	0.25	3	50.00	10	1:4	3
MH 3/22/05	041210	59	6931.34	0.8	0.25	3	51.00	10	1:4	3
MH 3/30/05	050580	02	605.59	0.65	0.25	1.3	88.00	20	1:2	4
MH 3/30/05	050580	03	605.59	0.65	0.25	1.3	88.00	20	1:2	4
MH 3/30/05	050580	07	1185.06	0.89	0.5	1.4	45.00	10	1:2	3
KM 3/16/2005	Lab Process Blank							20		3

QC Supervisor,



Kate March

QC Technician,



Minh Huynh

El Dorado Indirect Fiber Confirmation List

041172	1 A	8 actin xx	1344	1005	Zone Axis [1 0 0] - KM
041172	1 B	45 chrys xx	53	15757	Verified - KM
041172	2 D	102 chrys xx	1373	1033	Verified - KM
041172	2 E	137 actin xx	1379	1036	Ferrianactinolite - Zone Axis [3 3 2] - JH
041172	11 A	3 actin xx	57	15759	Zone Axis [1 0 1] - KM
041172	11 A	1 chrys xx	56	15758	Verified - KM
041188	3 A	1 chrys xx	59	15761	Verified - KM
041188	3 A	1 actin xx	58	15760	Zone Axis [3 1 2] - KM
041188	5 A	3 chrys xx	66	15771	Verified - KM
041188	5 B	11 treml xx	74	15774	Zone Axis [2 1 1] - KM
041188	5 B	28 actin xx	76	15575	Zone Axis [2 1 2] - KM
041188	5 B	37 amosi xx	77	15776	Zone Axis [7 1 4] - KM
041188	6 A	12 treml xx	1382	1039	Zone Axis [2 1 1] - KM
041188	6 A	5 actin xx	1381	1038	Zone Axis [3 1 2] - KM
041188	6 A	1 chrys xx	1380	1037	Verified - KM
041188	7 A	14 treml xx	1387	1044	Zone Axis [3 0 2] - JH
041188	7 A	15 chrys xx	1388	1045	Verified - JH
041188	7 B	34 actin xx	1390	1046	Zone Axis [1 0 1] - KM
041188	8 A	6 actin xx	88	15785	Zone Axis [4 0 3] - KM
041188	8 A	1 chrys xx	87	15784	Verified - KM
041188	9 A	1 chrys xx	1398	1054	Verified - KM
041188	9 A	3 actin xx	1399	1055	Zone Axis [5 1 2] - KM
041188	12 A	8 actin xx	89	15786	Zone Axis [3 -1 2] - KM
041188	12 A	9 chrys xx	90	15787	Verified - KM
041188	15 A	13 actin xx	5875	15794	Zone Axis [0 2 5] - KM
041188	15 B	31 chrys xx	93	15796	iITEM Image - Verified - KM
041188	19 A	2 actin xx	1391	1047	Zone Axis [2 0 1] - JH
041188	19 B	46 treml xx	1393	1049	Zone Axis [2 1 1] - KM
041188	19 A	6 chrys xx	1392	1048	Verified - KM
041188	20 A	3 actin xx	1401	1056	Zone Axis [9 1 4] - KM
041188	20 A	4 chrys xx	1402	1057	Verified - KM
041188	25 A	1 actin xx	1395	1061	Zone Axis [7 1 6] - JH
041188	25 A	1 chrys xx	117	1050	iITEM Image - Verified - KM
041188	27 A	12 actin xx	1397	1053	Zone Axis [2 0 3] - JH
041188	27 A	2 chrys xx	1396	1051	Verified - KM
041188	31 A	8 chrys xx	98	15800	Verified - JH
041188	31 B	43 actin xx	104	15805	Zone Axis [7 1 2] - JH
041188	37 A	5 chrys xx	1408	1062	Verified - KM
041188	37 A	5 actin xx	1409	1063	Zone Axis [2 0 1] - KM
041188	39 D	93 chrys xx	1459	1108	Verified - KM
041188	39 A	12 actin xx	1440	1091	Zone Axis [1 3 4] - KM
041188	39 B	33 amosi xx	1456	1107	Zone Axis [9 1 4] - KM
041188	40 A	7 chrys xx	127	15827	Verified - JH
041188	40 A	8 actin xx	128	15828	Zone Axis [3 1 3] - KM
041188	40 B	57 treml xx	141	15831	Zone Axis [1 0 1] - KM
041188	40 C	64 feedn xx	1482	15862	Potassic, Zone Axis [1 1 1] - JH
041188	40 C	66 winch xx	178	15875	Ferri, Zone Axis [4 -1 -1] - TM
041188	43 A	4 actin xx	1460	1110	Zone Axis [3 1 0] - KM
041188	43 A	4 chrys xx	1461	1111	Verified - KM
041188	44 B	46 treml xx	1480	1133	Zone Axis [5 1 4] - KM
041188	44 A	19 chrys xx	1471	1126	Verified - KM
041188	44 A	23 actin xx	1472	1127	Zone Axis [2 0 1] - JH
041188	44 B	40 edent xx	1473	1128	Zone Axis [3 1 6] - KM
041188	45 A	1 actin xx	179	15876	Zone Axis [1 0 0] - KM

041188	45 B	47 chrys xx	180	15877	Verified - KM
041188	47 A	4 chrys xx	1559	1193	Verified - KM
041188	47 A	11 actin xx	1560	1194	Zone Axis [9 1 8] - JH
041188	47 B	28 chrys xx	1561	1195	Verified - JH
041188	48 B	31 treml xx	227	15923	Zone Axis [5 1 6] - KM
041188	48 B	56 actin xx	1573	1207	Zone Axis [5 1 6] - KM
041188	48 A	3 chrys xx	226	15922	Verified - KM
041188	49 C	62 actin xx	237	15939	Zone Axis [3 1 2] - JH
041188	49 A	4 chrys xx	230	15926	Verified - JH
041188	86 A	12 chrys xx	258	15961	Verified - DW
041188	86 A	18 treml xx	260	15963	Zone Axis [5 1 4] - DW
041188	86 A	12 actin xx	259	15962	Zone Axis [5 1 4] - DW
041188	98 A	3 chrys xx	1563	1198	Verified - JH
041188	98 A	7 actin xx	1564	1199	Zone Axis [2 1 0] - JH
041188	101 A	1 actin xx	1565	1200	Zone Axis [3 0 2] - JH
041188	101 A	3 chrys xx	1566	1201	Verified - KM
041188	103 A	4 chrys xx	1567	1202	Verified - KM
041188	103 A	10 winch xx	1570	1204	Zone Axis [9 1 -6] - KM
041188	103 A	4 actin xx	1569	1203	Zone Axis [2 0 -3] - KM
041188	111 A	2 chrys xx	251	15953	DW 3-29-05
041188	111 A	20 actin xx	252	15954	Zone Axis [3 0 1] DW 3/30/05
041191	4 B	39 chrys xx	267	15976	Confirmed DW
041191	4 B	41 actin xx	268	15977	Zone Axis [1 0 0] DW
041191	5 A	13 edent xx	1579	1213	Potassian-edenite - Zone Axis [1 3 -6] - KM
041191	5 A	4 actin xx	1578	1212	Zone Axis [2 1 0] - JH
041191	5 A	1 chrys xx	1577	1211	Verified - KM
041191	6 A	3 actin xx	1582	1216	Zone Axis [1 0 1] - KM
041191	6 A	2 chrys xx	1581	1215	Verified - KM
041191	24 B	56 actin xx	273	15984	Zone Axis [1 -1 0] DW
041191	24 A	16 chrys xx	272	15983	Confirmed DW
041191	26 A	25 actin xx	1584	1218	Zone Axis [5 1 0] - JH
041191	28 A	7 chrys xx	219	15912	Verified - JH
041191	28 A	10 treml xx	220	15913	Zone [5 -1 2] - KM
041191	28 A	13 actin xx	221	15918	Zone [1 -1 1] - KM
041191	28 A	19 treml xx	222	15919	Zone [2 1 0] - KM
041191	28 F	164 chrys xx	1556	1192	Verified - JH
041191	29 F	157 treml xx	1540	1179	Zone Axis [2 1 1] - JH
041191	29 F	157 amosi xx	1539	1178	Zone Axis [2 0 1] - JH
041191	29 E	145 chrys xx	1536	1176	Verified - KM
041191	29 A	13 chrys xx	1530	1171	Verified - KM - Negative Overexposed
041191	29 A	14 actin xx	1531	1172	Zone Axis [3 1 0] - KM
041191	33 C	61 chrys xx	1549	1197	Verified - KM
041191	33 E	127 treml xx	1552	1189	Zone Axis [3 0 -1] - JH
041191	33 E	128 actin xx	229	15925	Zone Axis [1 -1 0] - DW
041191	34 B	47 actin xx	224	15920	Zone Axis [5 1 -2] - DW
041191	34 C	126 actin xx	225	15921	Zone Axis [5 1 -2] - DW
041191	35 A	14 chrys xx	1554	1191	Verified - JH
041191	35 A	6 actin xx	1553	1190	Zone Axis [9 1 0] - JH
041191	36 B	25 actin xx	306	16019	Zone Axis [9 1 6] - KM
041191	36 A	12 chrys xx	274	15986	Confirmed DW
041191	37 A	2 actin xx	1594	1224	Zone Axis [3 1 0] - JH
041191	37 B	33 chrys xx	1596	1225	Verified - KM
041191	39 A	24 actin xx	307	16021	Zone Axis [5 -1 0] DW
041191	40 A	23 actin xx	1597	1227	Zone Axis [1 1 0] - KM
041191	49 E	129 treml xx	1495	1138	Zone Axis [3 0 2] - JH
041191	49 A	1 actin xx	1483	1135	Zone axis [0 1 4] - JH

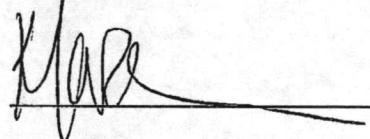
041191	49 A	4 chrys xx		1136	
041191	49 C	78 chrys xx	1494	1137	Verified - KM
041191	50 A	16 chrys xx	183	1580	Verified - JH
041191	50 A	25 actin xx	184	15881	Zone Axis [2 0 1] - JH
041191	51 B	58 actin xx	1497	1140	Zone Axis [5 1 2] - JH
041191	51 A	21 chrys xx	1496	1139	Verified - KM
041191	53 A	6 chrys xx	195	15889	Verified - KM
041191	53 A	23 anthp xx	196	15890	Zone Axis [1 0 0] - KM, transitional fiber with >90%
041191	53 D	102 amosi xx	199	15892	Zone Axis [3 1 0] - KM
041191	53 A	3 actin xx	194	15888	Zone Axis [3 1 1] - KM
041191	54 A	27 treml xx	218	1143	Item image, Zone Axis [1 0 1] - KM
041191	54 B	35 actin xx	1501	1144	Zone Axis [1 1 2] - KM
041191	54 A	5 chrys xx	1498	1141	Verified - KM
041191	55 D	158 actin xx	217	15910	Zone Axis [1 0 1] - KM
041191	55 A	44 chrys xx	216	15909	Verified - KM
041191	56 A	2 chrys xx	1516	1160	Verified - KM
041191	56 B	35 actin xx	1517	1161	Zone Axis [4 0 1] - JH
041191	87 A	35 actin xx	315	16028	Zone Axis [3 -1 2] DW
041191	87 B	42 chrys xx	316	16029	Confirmed DW
041191	108 A	8 actin xx	209	15902	Zone Axis [7 1 6] - KM
041191	108 B	43 edent xx	214	15907	Zone Axis [3 1 0] - KM
041191	108 B	45 treml xx	215	15908	Zone Axis [3 1 2] - KM
041191	109 A	6 actin xx	1499	1142	Zone Axis [3 1 6] - KM
041191	112 A	17 actin xx	1519	1163	Zone Axis [4 1 1] - JH
041191	112 A	5 chrys xx	1530	1170	Verified - JH
041210	46 A	10 actin xx	1572	1206	Zone Axis [5 -1 0] - KM
041210	46 A	5 chrys xx	1571	1205	Verified - KM
041210	47 A	24 actin xx	256	15959	Zone Axis [3 -1 0] - DW
041210	47 A	3 chrys xx	255	15958	Verified - DW
041210	47 A	2 actin xx	254	15957	Zone Axis [-2 -1 1]DW
041210	59 A	19 treml xx	1576	1210	Zone Axis [7 3 0] - JH
041210	59 A	2 chrys xx	1574	1208	Verified - JH
041210	59 A	17 actin xx	1575	1209	Zone Axis [5 1 6] - JH

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051021-El Dorado
Indirect Sample Prep Log

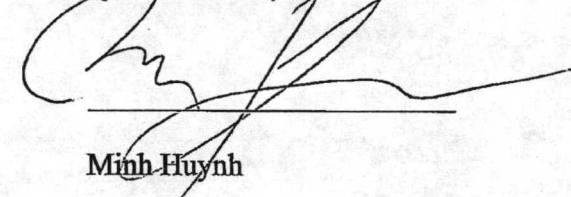
Job #	Client ID #	Original L/C Job #	Ash Date	Ash Tech	Ash Time	Hydrolyzed Date	Hydrolyzed Time	Prep Date	Prep Tech
051021-01	NFB-L2-1ZB-100504	041188-84	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-02	SFBA-L2-FB-100504	041188-95	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-03	SFBB-L2-1ZB-100604	041188-105	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-04	NYB-L2-1ZB-100704	041191-31	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-05	JEG-L2-1ZB-101004	041191-52	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-06	JEG-L2-FB-101004	041191-57	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-07	SRA-1ZB-100804	041210-51	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-08	NRA-FB-101004	041210-54	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH

QC Supervisor,



Kate March

QC Technician,



Minh Huynh

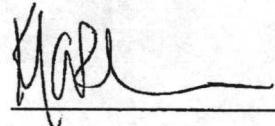
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A Professional Service Corporation in the Northwest

051021 El Dorado

Indirect Sample Prep List

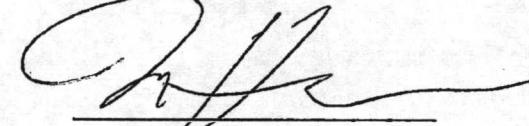
Prepped	Prep Tech	Client ID #	L/C Job #	L/C Original Job #	Sample Vol. (L)	Original Filter Area (mm ²)	Test Filter Area (mm ²)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Residual Volume (ml)	Aliquot (ml)	Dilution
6/8/2005	MH	NFB-L2-1ZB-100504	051021-01	041188-84	301.29	385	193	0.89	0.5	0.1	89	20	20	1:1
6/8/2005	MH	SFBA-L2-FB-100504	051021-02	041188-95	0.00	385	193	0.89	0.5	0.1	9	20	20	1:1
6/8/2005	MH	SFBB-L2-1ZB-100604	051021-03	041188-105	308.75	385	193	0.89	0.5	0.1	86	20	20	1:1
6/8/2005	MH	NYB-L2-1ZB-100704	051021-04	041191-31	302.05	385	193	0.89	0.5	0.1	88	20	20	1:1
6/8/2005	MH	JEG-L2-1ZB-101004	051021-05	041191-52	299.29	385	193	0.89	0.5	0.1	88	20	20	1:1
6/8/2005	MH	JEG-L2-FB-101004	051021-06	041191-57	299.90	385	193	0.89	0.5	0.1	94	20	20	1:1
6/8/2005	MH	SRA-1ZB-1008004	051021-07	041210-51	6655.05	385	193	0.89	0.5	0.1	13	20	20	1:1
6/8/2005	MH	NRA-FB-101004	051021-08	041210-54	0.00	385	193	0.89	0.5	0.1	9	20	20	1:1
6/8/2005	MH		051021-QC					NA						

QC Supervisor,



Kate March

QC Technician,



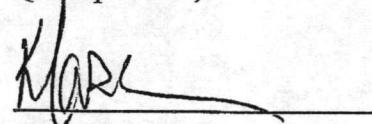
Minh Huynh

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

051020 El Dorado
Column Blank Prep List

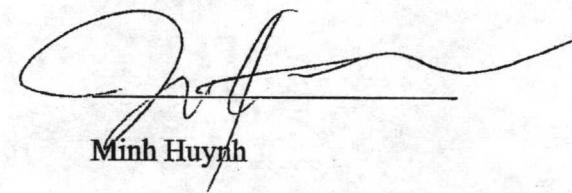
Lab/Cor ID #	Client ID #	New Lab/Cor ID #	Original Filter Date	Filter Prepper	Sample Prep Date	Prep Tech
041188-08	CC5-H6-1CP-100604	051020-01	1/21/2005	MH	6/1/2005	MH
041188-86	SFBA-H2-2PG-100504	051020-02	3/22/2005	MH	6/1/2005	MH
041188-111	SFBC-H2-4PG-100604	051020-03	3/22/2005	MH	6/1/2005	MH
041191-108	JEG-H2-1FD-101004	051020-04	3/7/2005	MH	6/1/2005	MH

QC Supervisor,



Kate March

QC Technician,



Minh Huynh

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Microscope Based Quality Control Summary Table
May 2005

Historical Averages (Philips 410LS)							Historical Averages (Jeol 1200)						
Mag	Freq	MAvg	HAvg	Accpt	Date	Status	Freq	MAvg	HAvg	Accpt	Date	Status	
- 550x	Mthly	548.39	565	PASS	5/4/2005	DONE	Mthly	4750	**		5/4/2005	DONE	
- 10K	Mthly	9990.6	10410	PASS	5/4/2005	DONE	Mthly	9634	**		5/4/2005	DONE	
- 18K	Mthly	17544	18041	PASS	5/4/2005	DONE	Mthly	18816	**		5/4/2005	DONE	
EDS													
- (K-factor)Mg:Fe	BiYrly	1.35	1.5	PASS	1/11/2005	DONE	BiYrly	0.74	1.5	PASS	3/14/2005	DONE	
- Mn Resol.	Mthly	153	175	PASS	5/6/2005	DONE	Mthly	154	175	PASS	5/4/2005	DONE	
Misc. Calibrations													
CL	Wkly	718.93	723	PASS	5/5/2005	DONE	Wkly	805.53	**		5/20/2005	DONE	
Spot	Qrtly	166.3	250	PASS	2/9/2005	DONE	Qrtly	180.4	250	PASS	3/16/2005	DONE	
Dose	Qrtly			PASS	5/6/2005	DONE	Qrtly			PASS	3/18/2005	DONE	
SRM 1876b	Yrly			PASS	5/9/2005	DONE	Yrly			PASS	7/1/2004	DONE	
Albite Std	BiYrly			PASS	1/7/2005	DONE	BiYrly			PASS	1/7/2005	DONE	
Na Croc. Std Peak	Mthly			PASS	5/6/2005	DONE	Mthly			PASS	5/4/2005	DONE	
Plasma Asher	BiYrly			PASS	3/18/2005	DONE	BiYrly			PASS	3/18/2005	DONE	
Deficiency Corrections	None												
Sample Custody Errors	None												

**No Historical Average available.

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Microscope Based Quality Control Summary Table
June 2005

Historical Averages (Philips 410LS)							Historical Averages (Jeol 1200)						
Mag	Freq	MAvg	HAvg	Accpt	Date	Status	Freq	MAvg	HAvg	Accpt	Date	Status	
- 550x	Mthly	548.39	563	PASS	6/6/2005	DONE	Mthly	4854	**		6/9/2005	DONE	
- 10K	Mthly	10319	10396	PASS	6/6/2005	DONE	Mthly	9664	**		6/9/2005	DONE	
- 18K	Mthly	17906	18036	PASS	6/6/2005	DONE	Mthly	18605	**		6/9/2005	DONE	
EDS													
- (K-factor)Mg:Fe	BiYrly	1.35	1.5	PASS	1/11/2005	DONE	BiYrly	0.74	1.5	PASS	3/14/2005	DONE	
- Mn Resol.	Mthly	152	175	PASS	6/23/2005	DONE	Mthly	155	175	PASS	6/8/2005	DONE	
Misc. Calibrations													
CL	Wkly	723.08	723	PASS	6/6/2005	DONE	Wkly	811.23	**		6/13/2005	DONE	
Spot	Qrtly	193	250	PASS	6/22/2005	DONE	Qrtly	180.4	250	PASS	3/16/2005	DONE	
Dose	Qrtly			PASS	5/6/2005	DONE	Qrtly			PASS	3/18/2005	DONE	
SRM 1876b	Yrly			PASS	5/9/2005	DONE	Yrly			PASS	7/1/2004	DONE	
Albite Std	BiYrly			PASS	1/7/2005	DONE	BiYrly			PASS	1/7/2005	DONE	
Na Croc. Std Peak	Mthly			PASS	6/6/2005	DONE	Mthly			PASS	6/8/2005	DONE	
Plasma Asher	BiYrly			PASS	3/18/2005	DONE	BiYrly			PASS	3/18/2005	DONE	
Deficiency Corrections	None												
Sample Custody Errors	None												

**No Historical Average available.

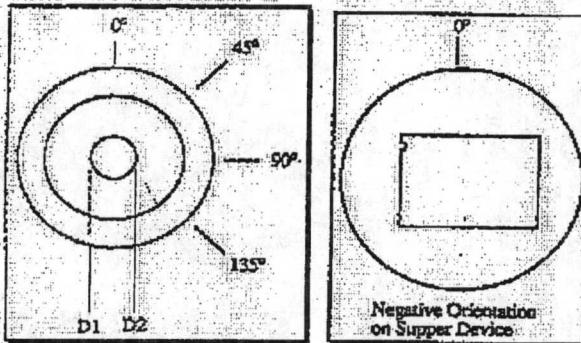
**PHILLIPS
JUNE 2005**

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/11/2005	Average Camera Constant:	26.754 mmA
Negative Number:	5908	(All 12 Measurements)	
Date Negative was Taken:	6/6/2005	Average Camera Length:	723.08 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	68.33	90.85	22.52	11.26	26.52	716.68	65.10	87.80	22.70	11.35	26.73	722.41
2	66.52	92.55	26.03	13.02	26.54	717.23	63.35	89.55	26.20	13.10	26.71	721.92
3	61.15	97.95	36.80	18.40	26.53	717.10	57.80	94.95	37.15	18.58	26.79	723.92

Ring #	90 degrees						135 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	64.90	87.90	23.00	11.50	27.08	731.96	68.10	90.75	22.65	11.33	26.67	720.82
2	63.18	89.65	26.47	13.24	26.99	729.36	66.30	92.45	26.15	13.08	26.66	720.54
3	57.58	95.10	37.52	18.76	27.05	731.13	60.80	97.95	37.15	18.58	26.79	723.92



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D₁ = The smaller measurement on the Supper device (mm).

D₂ = The larger measurement on the Supper device (mm).

$$D = D_2 - D_1$$

$$R = D/2$$

CC = Camera Constant

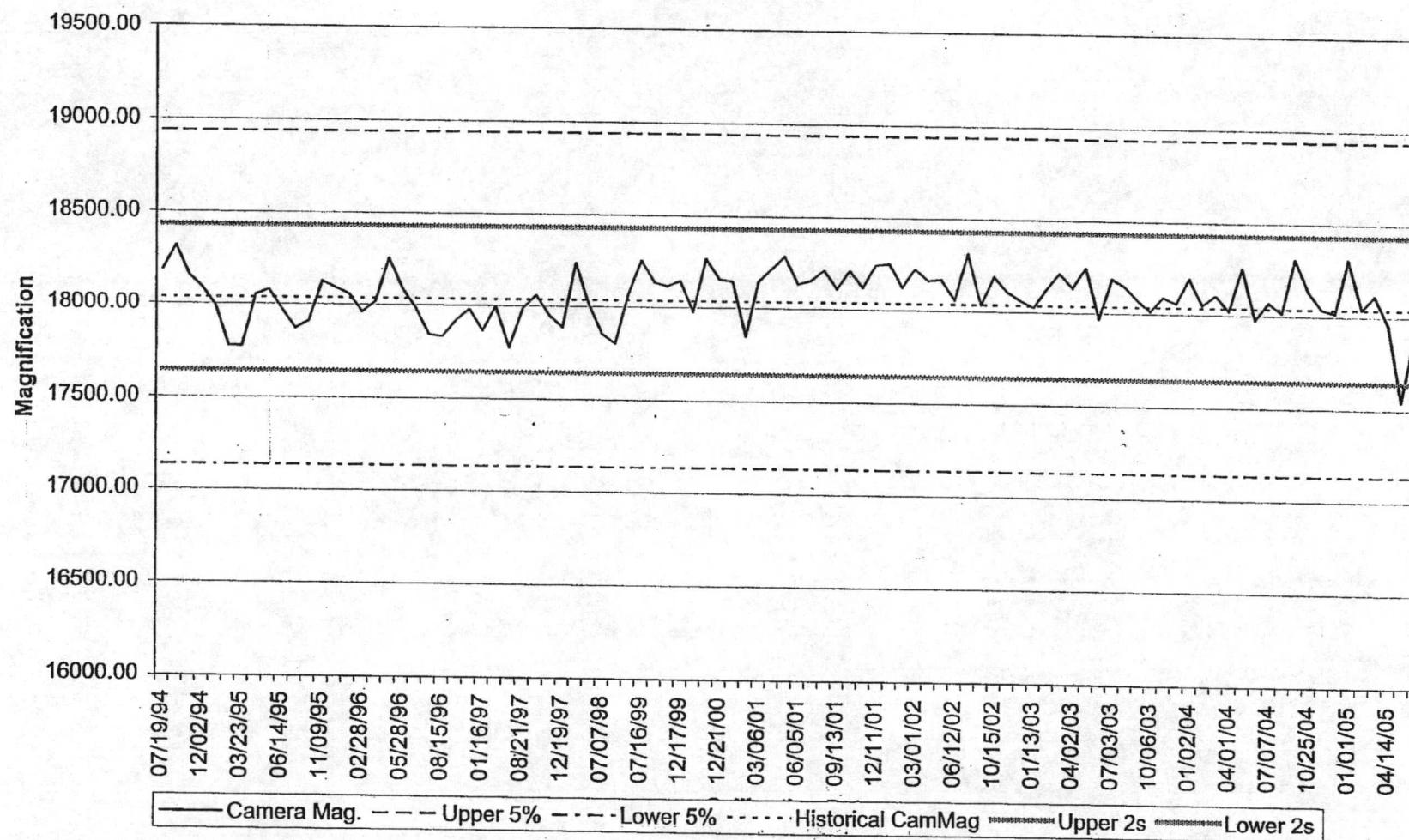
For Ring 1 [111], CC = R*2.355

For Ring 2 [200], CC = R*2.039

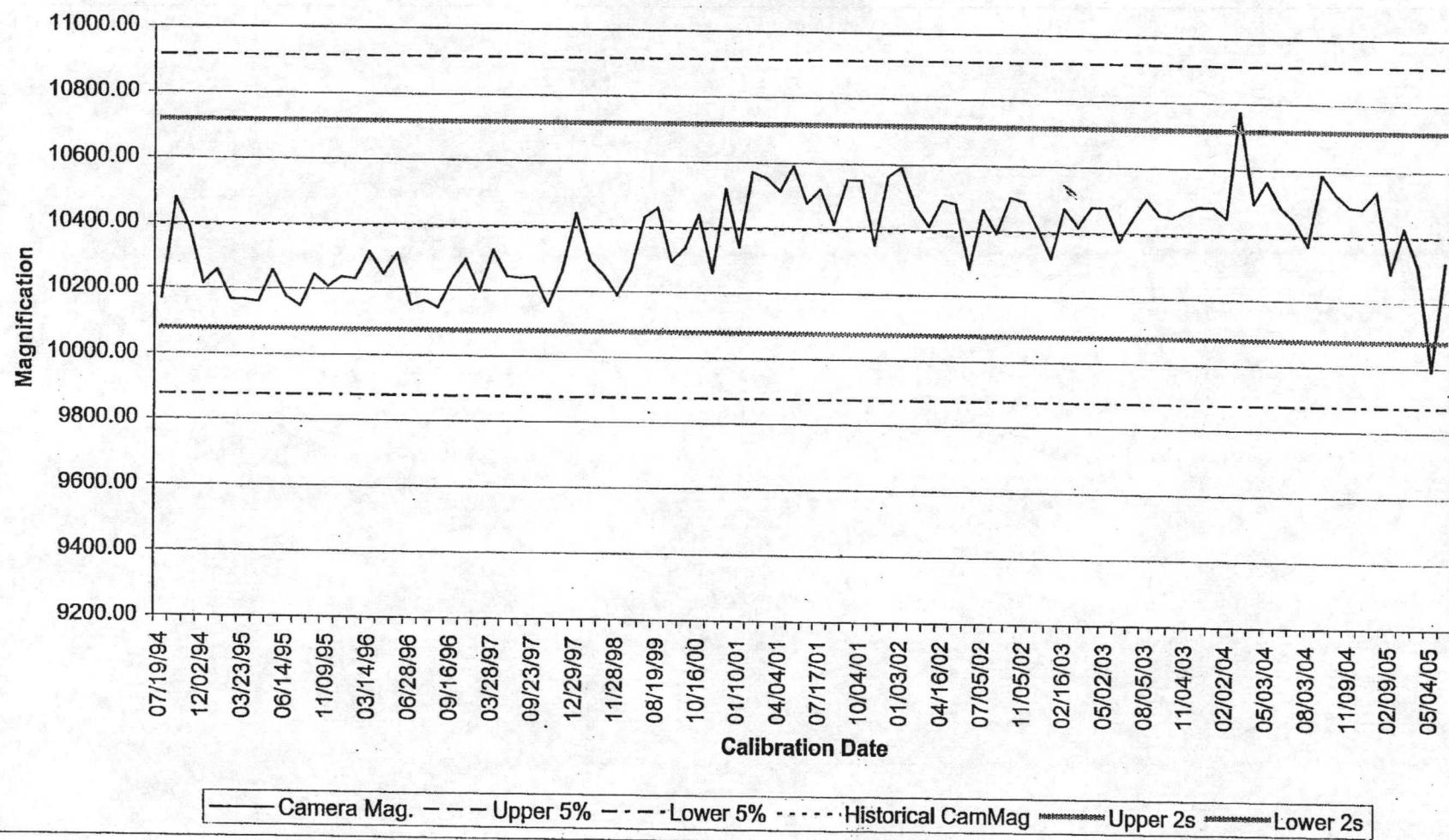
For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

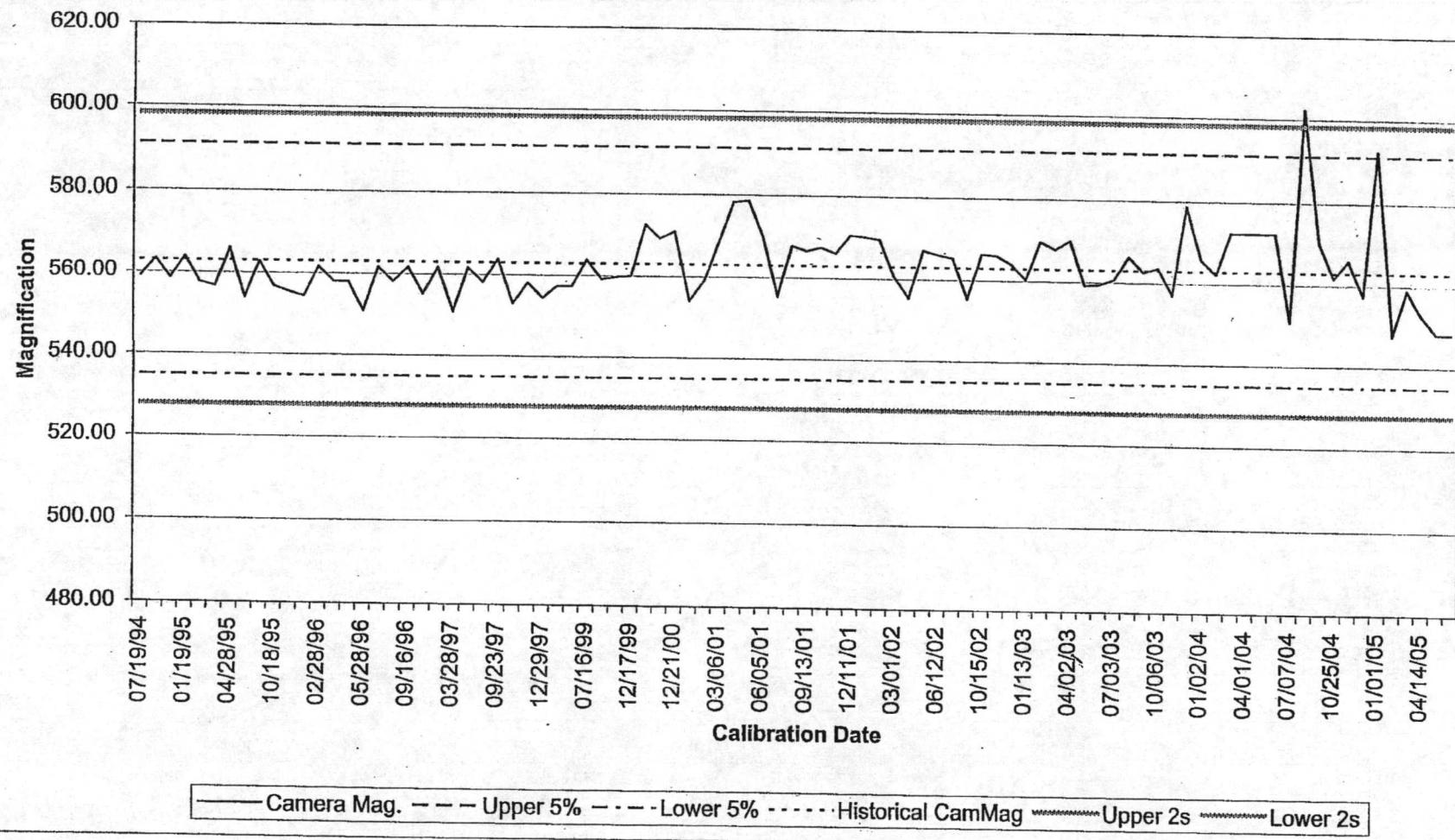
Philips 410 - Camera Magnification Calibration
Setting 18,000
07/94 to 06/05



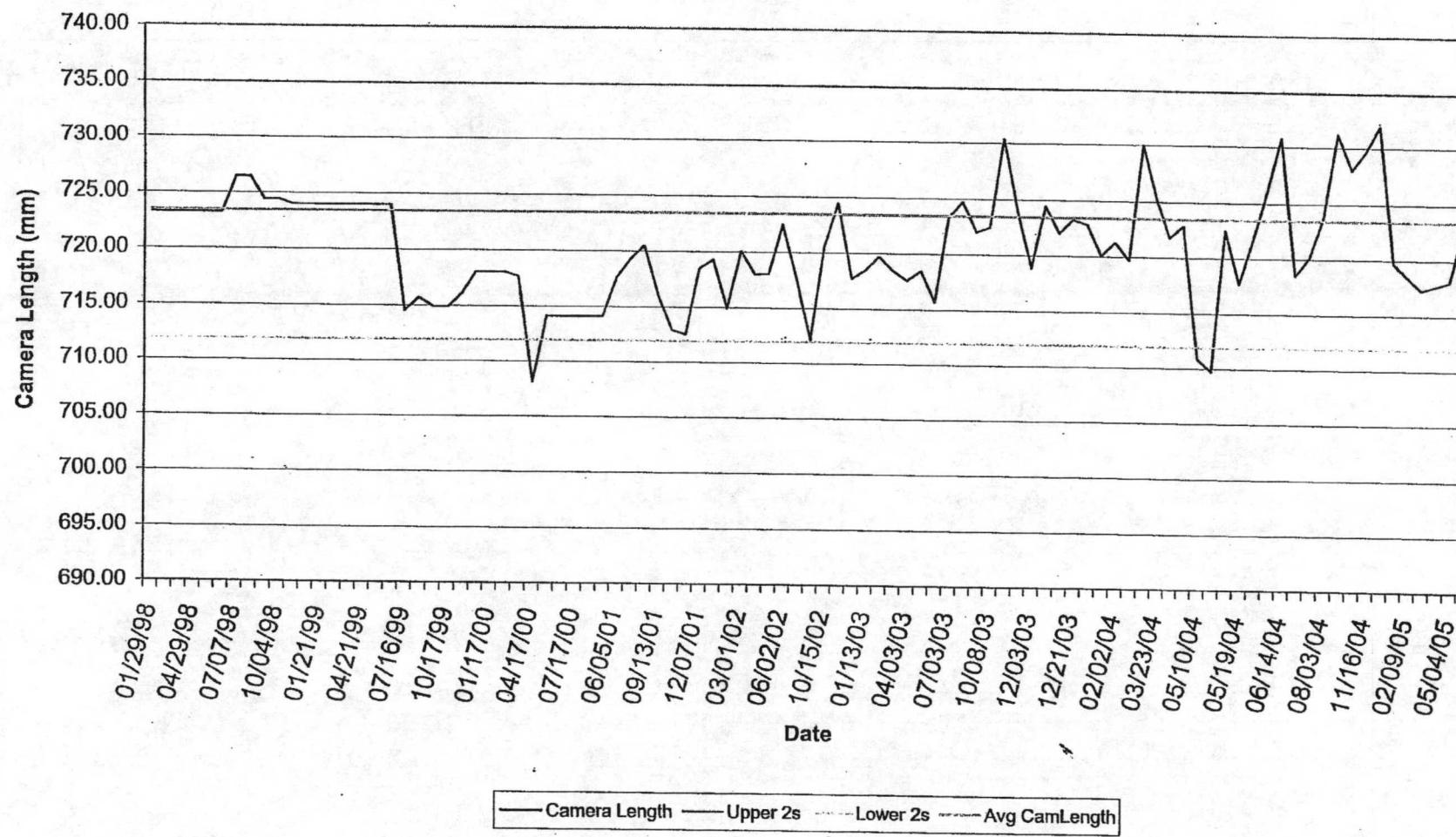
Philips 410 - Camera Magnification Calibration
Setting 10,000
07/94 to 06/05



Philips 410 - Camera Magnification Calibration
Setting 550
07/94 to 06/05



Camera Length - Philips 410 (100KV)
January 1998 - May 2005



Screen and Camera Magnification Calibration

Date of Measurement: 6/6/2005

Analyst: dw

Average:

Screen Magnification at 18,000:	17383.18
Screen Magnification at 10,000:	9760.93

Camera Magnification at 18,000:	17906.40
Camera Magnification at 10,000:	10319.40
Camera Magnification at 550:	548.39

Setting 18,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
6/6/2005	5910	38.55	121.45	82.90	10.00	17906.40

Screen

Date	# Spaces	Magnification
6/6/2005	19.26	17383.18

Setting 10,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
6/6/2005	5911	35.15	130.70	95.55	20.00	10319.40

Screen

Date	# Spaces	Magnification
6/6/2005	34.30	9760.93

Setting 550

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
6/6/2005	5912	64.70	90.85	26.15	103.00	548.39

D1 = The smaller measurement of the Supper Device in mm.

D2 = The larger measurement of the Supper Device in mm.

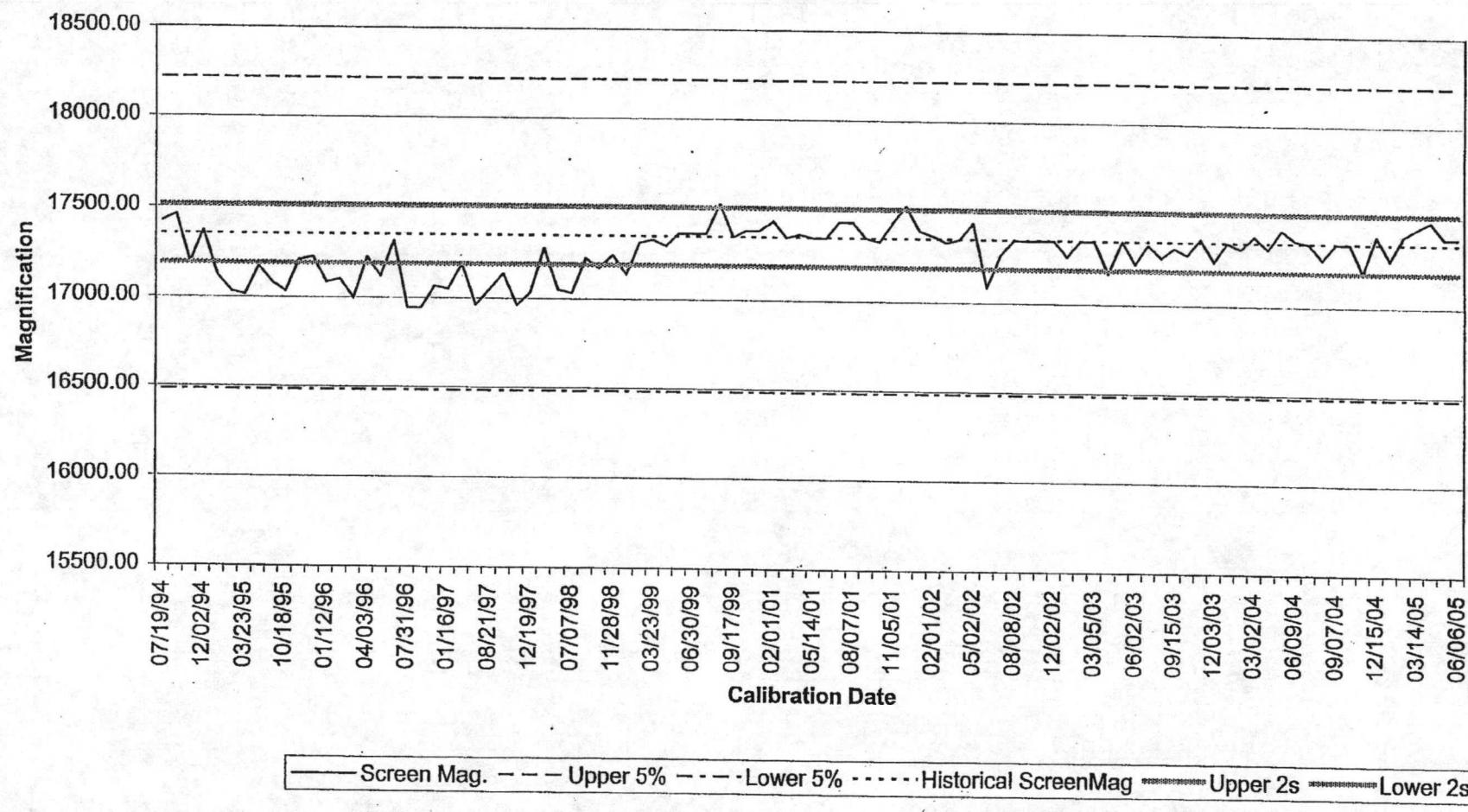
D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

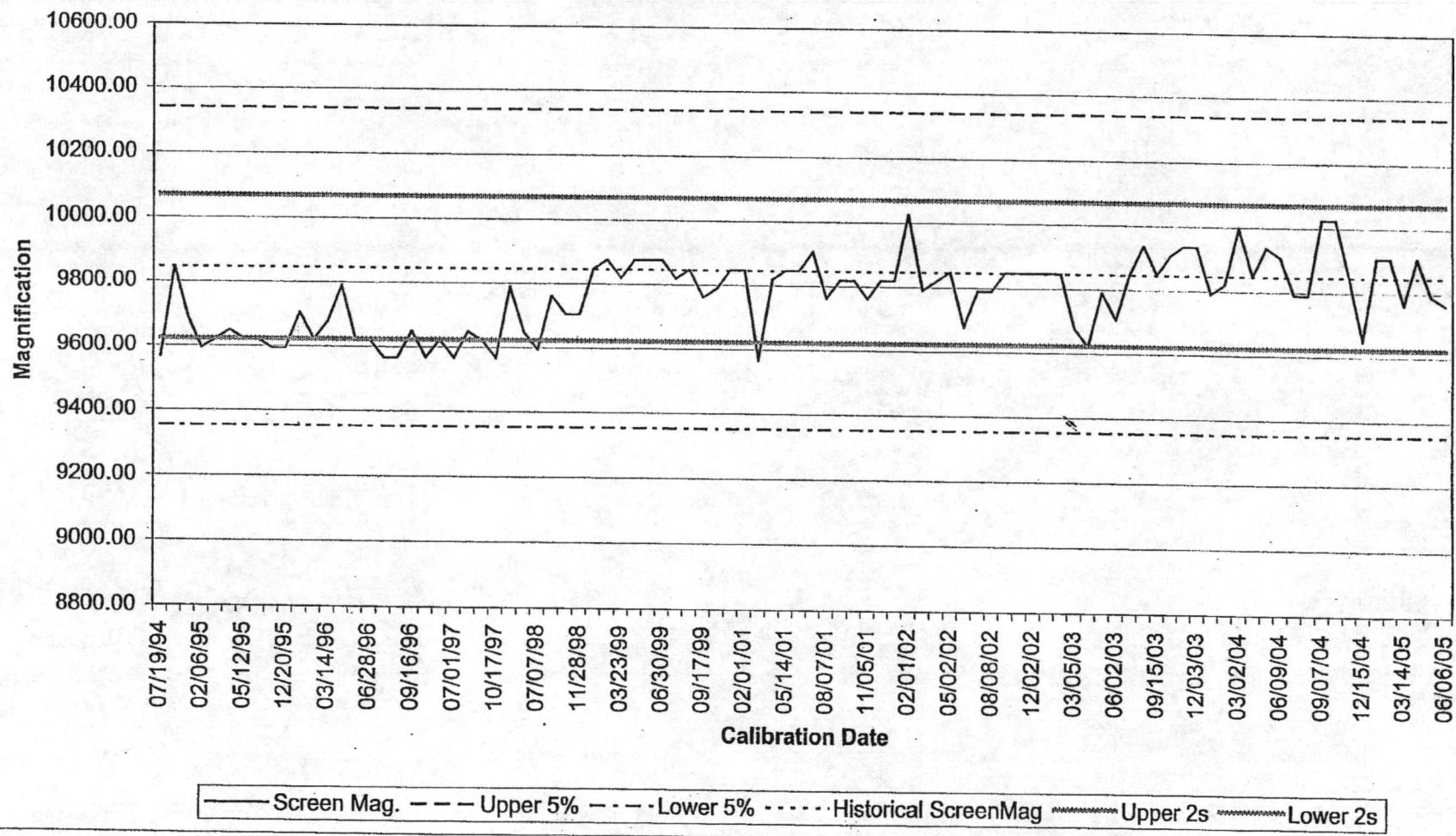
Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

Philips 410 - Screen Magnification Calibration
Setting 18,000
07/94 to 06/05



Philips 410 - Screen Magnification Calibration
Setting 10,000
07/94 to 06/05



Na Crocidolite Std. Calibration

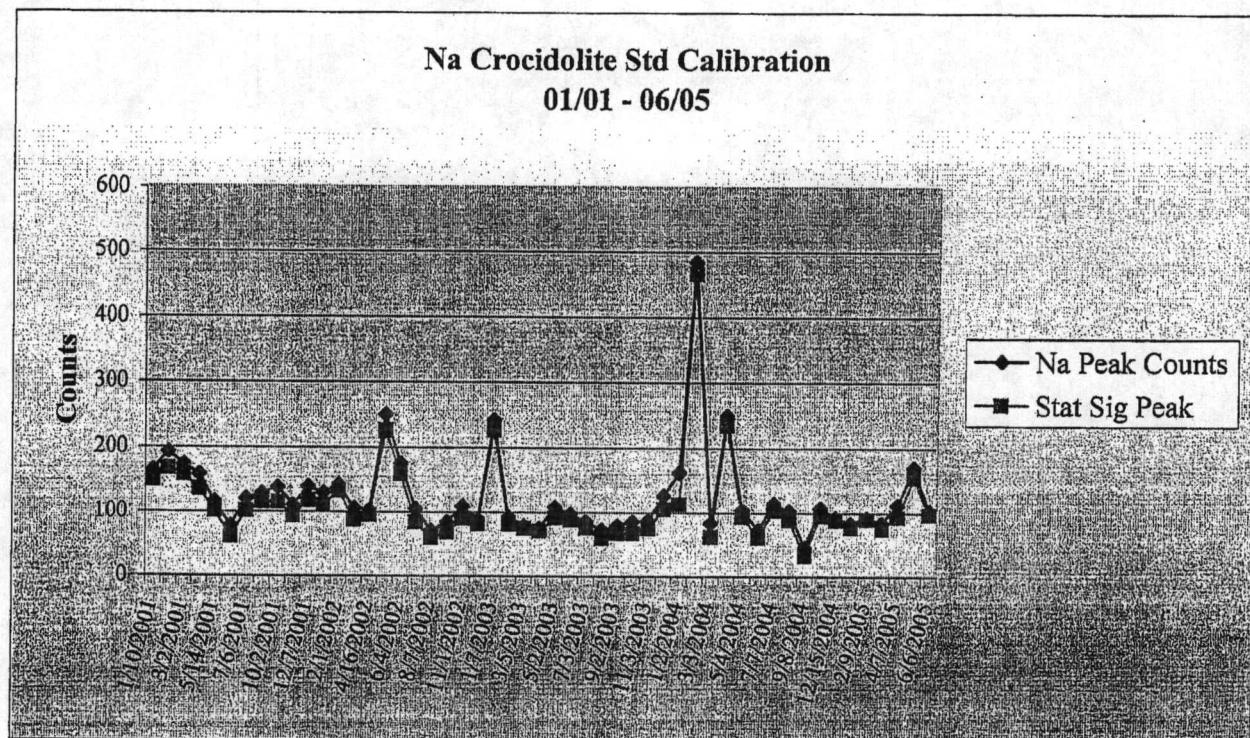
Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
1/10/2001	DW	9707	y	165	67	149.5	Pass
2/2/2001	DW	9753	y	193	71	167.5	Pass
3/2/2001	DW	9819	y	174	71	158	Pass
4/4/2001	DW	10012	y	158	56	135	Pass
5/14/2001	DW	10325	y	116	43	101	Pass
6/8/2001	DW	10405	y	78	22	61	Pass
7/6/2001	DW	10481	y	120	41	101	Pass
8/1/2001	DW	10631	y	129	50	114.5	Pass
10/2/2001	DW	10850	y	138	45	114	Pass
11/2/2001	DW	10966	y	110	38	93	Pass
12/7/2001	DW	11054	y	139	48	117.5	Pass
1/2/2002	DW	11121	y	130	45	110	Pass
2/1/2002	DW	11206	y	143	61	132.5	Pass
3/1/2002	DW	11272	y	106	34	87	Pass
4/16/2002	DW	11373	y	103	43	94.5	Pass
5/2/2002	DW	11465	y	250	100	225	Pass
6/4/2002	DW	11530	y	175	71	158.5	Pass
7/1/2002	DW	11799	y	105	31	83.5	Pass
8/7/2002	DW	12319	y	70	24	59	Pass
10/12/2002	DW	12633	y	84	26	68	Pass
11/1/2002	DW	12668	y	109	35	89.5	Pass
12/1/2002	DW	12779	y	88	37	81	Pass
1/7/2003	DW	13008	y	241	106	226.5	Pass
2/7/2003	KM	13078	y	93	34	80.5	Pass
3/5/2003	KM	13164	y	79	35	74.5	Pass
4/3/2003	KM	13225	y	75	32	69.5	Pass
5/2/2003	KM	13340	y	108	37	91	Pass
6/1/2003	KM	13436	y	97	39	87.5	Pass
7/3/2003	KM	13579	y	85	33	75.5	Pass
8/5/2003	KM	13712	y	72	23	59	Pass
9/2/2003	KM	13827	y	79	28	67.5	Pass
10/1/2003	KM	13979	y	85	25	67.5	Pass
11/3/2003	KM	14046	y	87	31	74.5	Pass
12/3/2003	KM	14130	y	126	42	105	Pass
1/2/2004	KM	14176	y	162	31	112	Pass
2/2/2004	KM	14239	y	484	224	466	Pass

3/3/2004	KM	14284	y	83	20	61.5	Pass
4/1/2004	KM	14370	y	249	110	234.5	Pass
5/4/2004	KM	14538	y	104	41	93	Pass
6/8/2004	KM	14818	y	72	24	60	Pass
7/7/2004	DW	14868	Y	114	47	104	Pass
8/3/2004	DW	14932	Y	103	36	87.5	Pass
9/8/2004	KM	15031	Y	45	10	32.5	Pass
11/1/2004	KM	15277	Y	107	41	94.5	Pass
12/15/2004	MQ	15568	Y	93	41	87.5	Pass
1/1/2005	KM	15628	Y	83	35	76.5	Pass
2/9/2005	DW	15915	Y	92	43	89	Pass
3/18/2005	DW	15914	Y	84	32	74	Pass
4/7/2005	MQ	16007	Y	112	37	93	Pass
5/6/2005	DW	16085	Y	170	70	155	Pass
6/6/2005	DW	16178	Y	103	45	96.5	Pass

*ND - Not Done

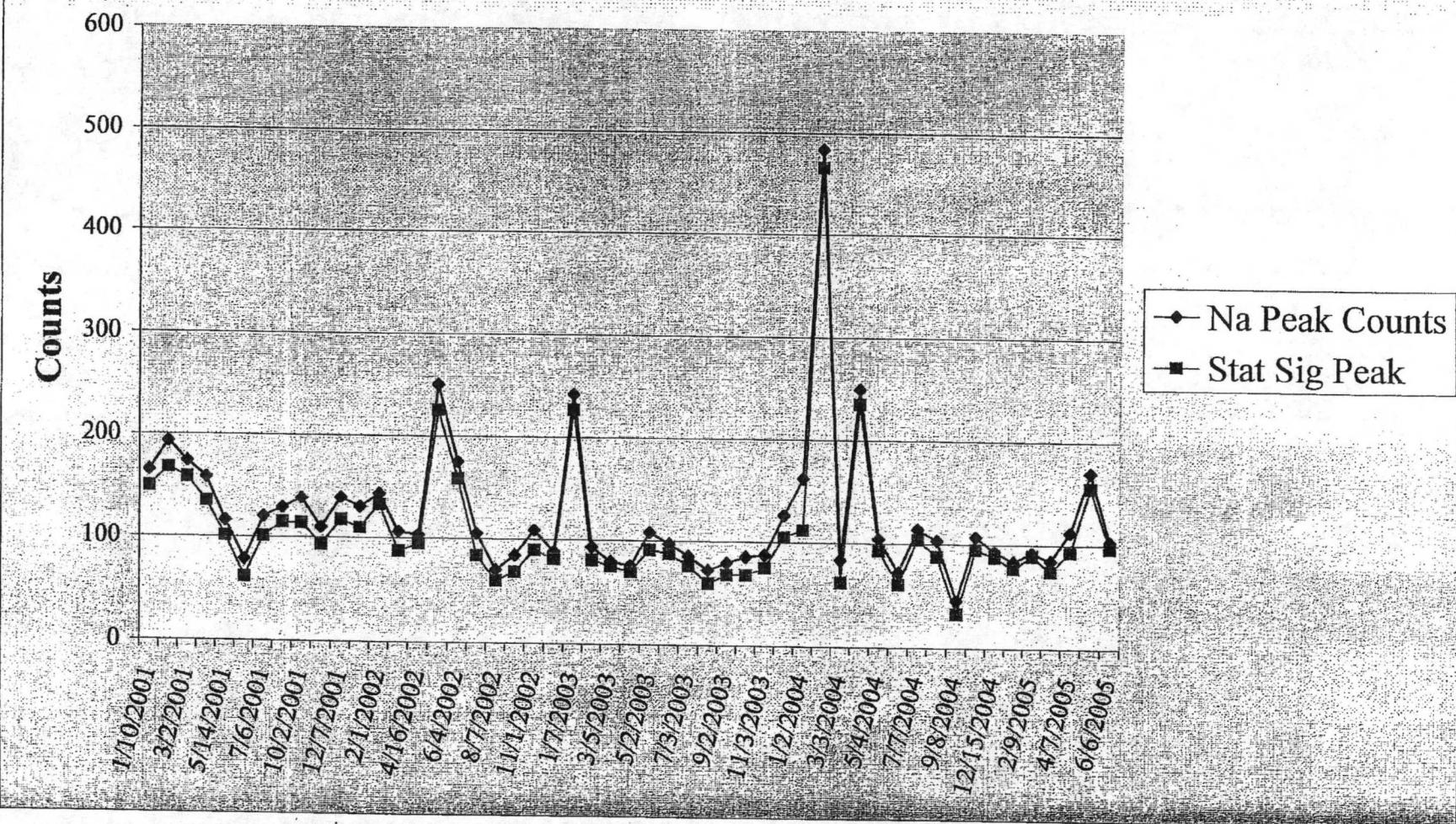
** Peak count is the maximum Na peak count

***Background peak count is the base, right of the Na peak



Na Crocidolite Std Calibration

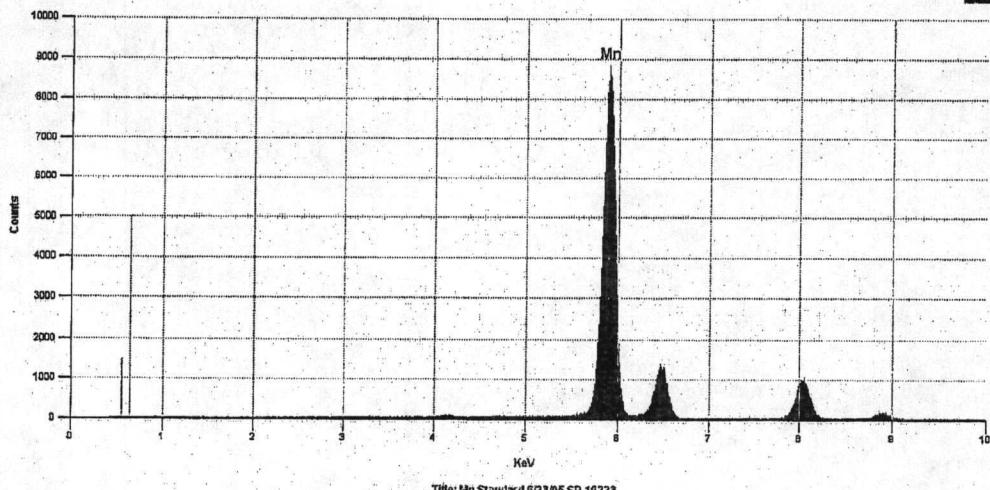
01/01 - 06/05



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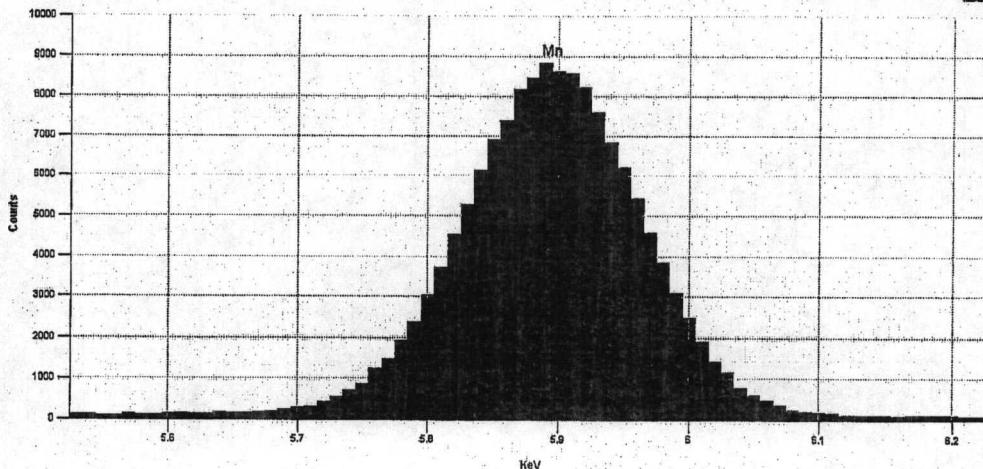
Mn Monthly Std
EDS#[16223]
[6-23-05] ITEM Image

WINEDS



Title: Mn Standard 6/23/05 SP 16223

WINEDS



Title: Mn Standard 6/23/05 SP 16223

Peak Statistics : EDS 16223

Peak	Energy	Height	FWHM	Area
1	5.896	8551	152	139241
2	6.483	1234	160	21060
3	8.038	950	169	17180

PHILIPS MnKa Peak Resolution Calibration

Date	Analyst	EDS	Mn Peak (cnts)	FWHM High (cnts)*	FWHM Low (cnts)*	FWHM (cnts)*	# Channels	Resolution (eV)	Std Dev	Std Dev (2s)	Pass/Fail
2/5/02	DW		14255	7466	6369	6918	17	170			Pass
2/13/02	DW		10830	5441	4460	4951	17	170			Pass
2/26/02	DW		10070	5734	4772	5253	16	160			Pass
3/1/02	DW		10243	5177	4378	4778	15	150			Pass
3/20/02	DW		7684	3964	3290	3627	16	160			Pass
4/16/02	DW		10042	5693	4729	5211	16	160			Pass
5/2/02	DW	11466	10022	5310	4438	4874	17	170			Pass
6/4/02	DW	11531	10252	5421	4480	4951	16	160			Pass
7/1/02	DW	11800	10300	5749	4799	5274	16	160			Pass
8/7/02	DW	12318	10640	5905	4825	5365	17	170			Pass
10/1/02	DW	12634	15662	8414	7183	7799	17	170			Pass
11/1/02	DW	12667	20000	10797	9338	10068	17	170			Pass
12/2/02	DW	12778	10303	5421	4410	4916	16	160			Pass
1/7/03	DW	13007	10303	5569	4559	5064	14	140			Pass
2/7/03	KM	13089	10427	5960	4156	5058	17	170			Pass
3/5/2003	KM	13165	2348	1046	1279	1163	17	170			Pass
4/3/2003	KM	13226	10313	5676	4731	5204	16	160			Pass
5/5/2003	KM	13341	11454	5815	4977	5396	17	170			Pass
6/1/2003	KM	13437	9806	5385	4577	4981	17	170			Pass
7/3/2003	KM	13580	10335	5440	4620	5030	17	170			Pass
8/5/2003	KM	13713	10233	5686	4710	5198	17	170			Pass
9/2/2003	KM	13828	12311	6552	5661	6107	17	170			Pass
10/1/2003	KM	13981	10934	6341	5440	5891	17	170			Pass
11/3/2003	KM	14047	12783	7599	6376	6988	17	170	3.162	6.325	Pass
12/3/2003	KM	14131	10314	5258	4476	4867	17	170	3.162	6.325	Pass
1/2/2004	KM	14175	9901	5102	4166	4634	17	170	3.162	6.325	Pass
2/2/2004	KM	14240	10370	4747	5732	5240	17	170	0.000	0.000	Pass
3/3/2004	KM	14285	10232	5374	4428	4901	16	160	3.162	6.325	Pass
4/1/2004	KM	14371	9603	5532	4718	5125	17	170	3.162	6.325	Pass
5/4/2004	KM	14542	10344	4743	4017	4380	17	170	3.162	6.325	Pass
6/8/2004	KM	14819	10084	5420	4601	5011	17	170	3.162	6.325	Pass
7/7/2004	DW	14868	12292	5971	5843	5907	16	160	4.216	8.433	Pass
9/8/2004	KM	15032	6799	4180	3197	3689	16	160	4.830	9.661	Pass
11/1/2004	KM	15278	10251	6145	5244	5695	16	160	4.924	9.847	Pass
12/15/2004	DW	15566	10227	5288	4330	4809	17	170	4.924	9.847	Pass
1/6/2005	DW	15917	3665	1451	1768	1610	16	160	5.149	10.299	Pass
2/9/2005	KM						16	160	5.222	10.445	Pass
3/18/2005	DW	15916	10784	4630	5736	5183	16	160	5.189	10.377	Pass
4/14/2005	KM	16038	6471				15.1	151	6.135	12.270	Pass
5/5/2005	DW	16086	10321				15.3	153	6.362	12.724	Pass
6/4/2005	KM	16223	8551				15.2	152	6.918	13.836	Pass

* Data is historical for the most recent 12 months
(cnts)* These counts are no longer necessary as the WinEDS program calculates the FWHM automatically.

PHILLIPS
MAY 2005

Screen and Camera Magnification Calibration

Date of Measurement: 5/4/2005

Analyst: MQ

Average:

Screen Magnification at 18,000:	17383.18
Screen Magnification at 10,000:	9789.47

Camera Magnification at 18,000:	17543.52
Camera Magnification at 10,000:	9990.57
Camera Magnification at 550:	548.39

Setting 18,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
5/4/2005	5901	33.90	115.12	81.22	10.00	17543.52

Screen

Date	# Spaces	Magnification
5/4/2005	19.26	17383.18

Setting 10,000

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
5/4/2005	5902	34.90	122.78	87.88	19.00	9990.57

Screen

Date	# Spaces	Magnification
5/4/2005	34.20	9789.47

Setting 550

Camera

Date	Negative #	D ₁	D ₂	D	# Spaces	Magnification
5/4/2005	5903	64.70	90.85	26.15	103.00	548.39

D₁ = The smaller measurement of the Supper Device in mm.

D₂ = The larger measurement of the Supper Device in mm.

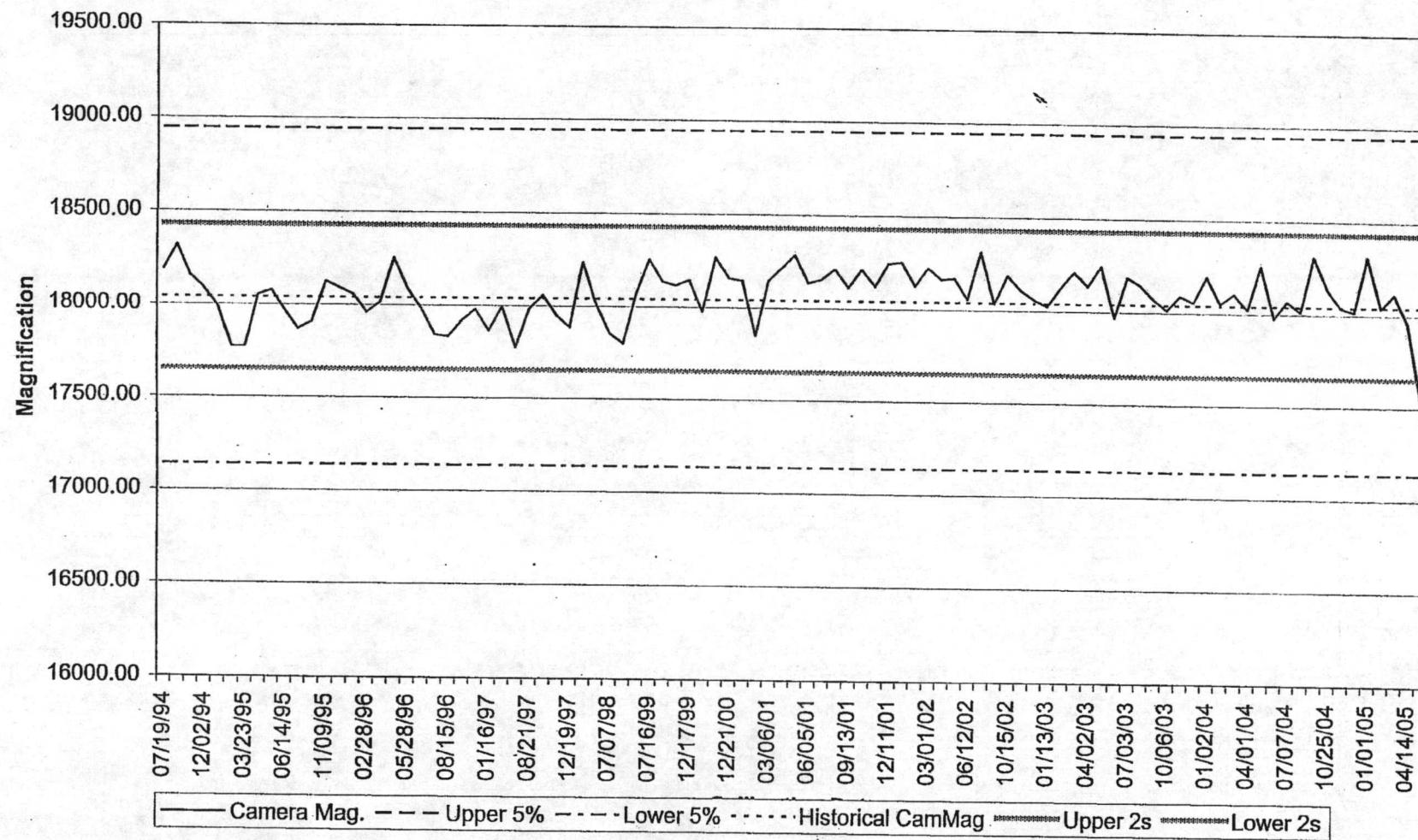
D = D₂ - D₁

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

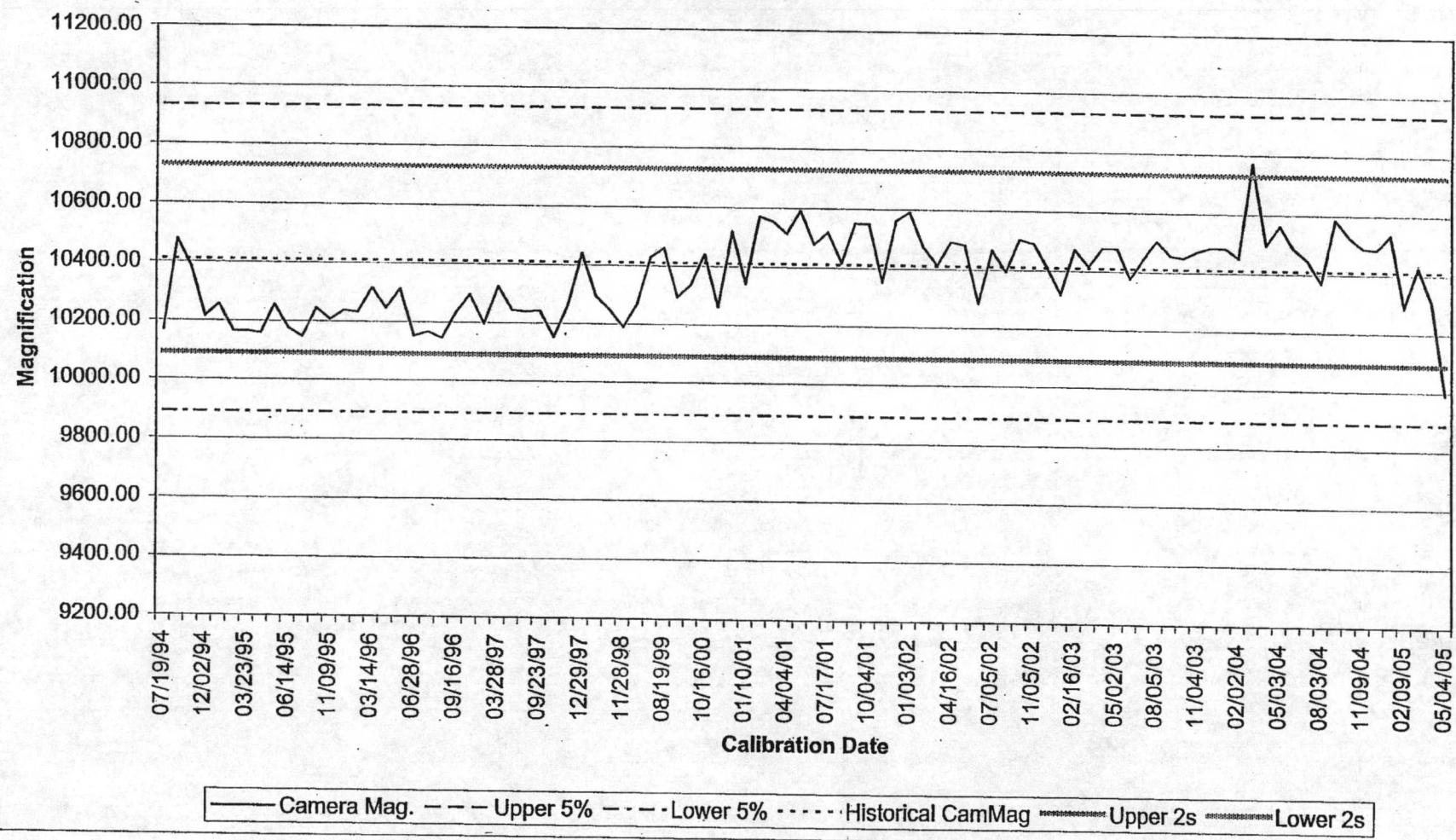
Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

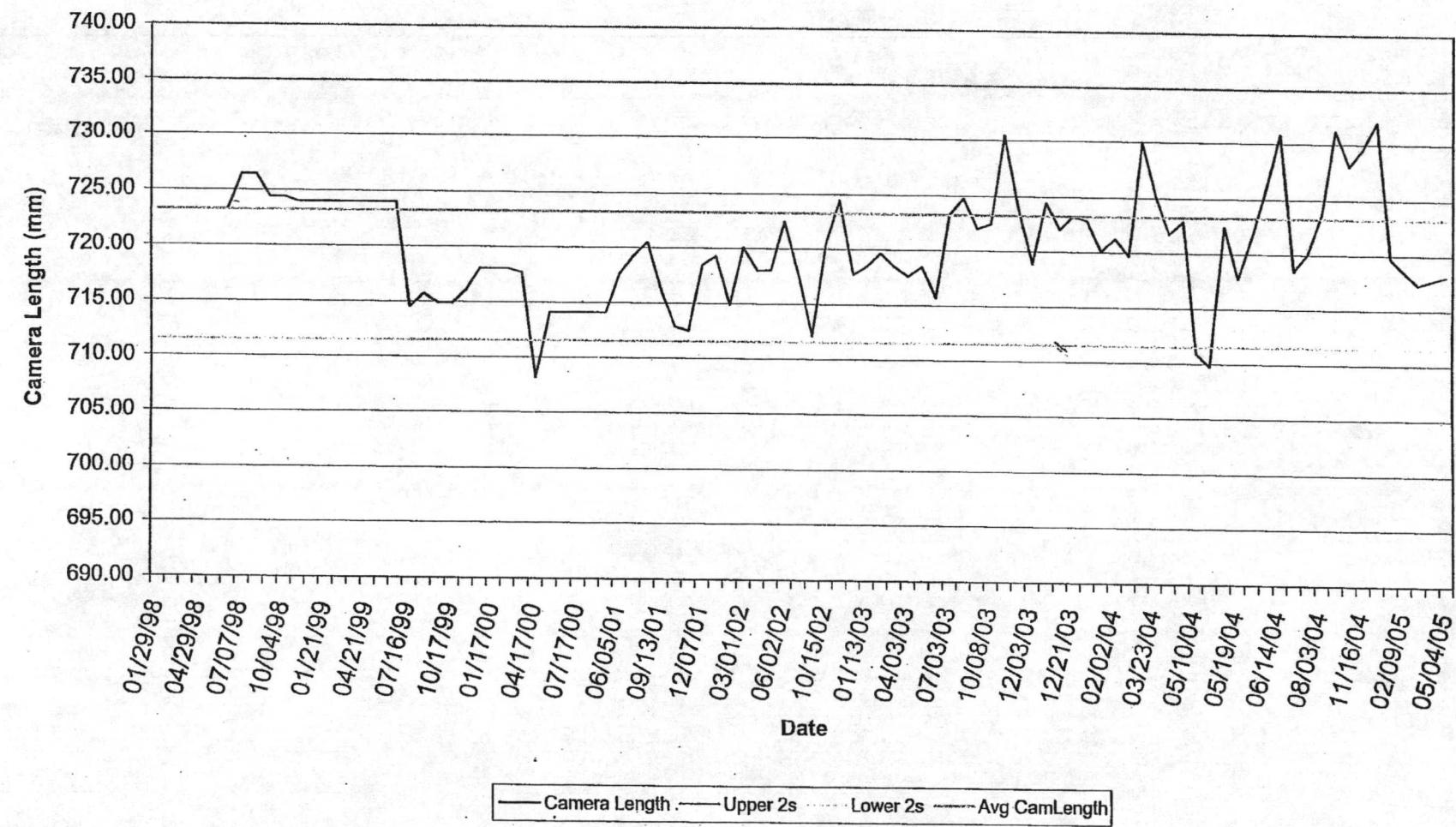
Philips 410 - Camera Magnification Calibration
Setting 18,000
07/94 to 05/05



Philips 410 - Camera Magnification Calibration
Setting 10,000
07/94 to 05/05



Camera Length - Philips 410 (100KV)
January 1998 - May 2005



Screen Magnification Calibration (Philips 410)

(Version#1)

Date of Measurement: 5/4/2005

Analyst: MH

Average:

Screen Magnification at 18,000:	17383
Screen Magnification at 10,000:	9789

Setting 18,000

Screen

Date	# Spaces	Magnification
5/4/2005	19.26	17383

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	5.25	5.07

Small Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	0.53	0.51

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	4.60	4.44	0.058	0.575

Setting 10,000

Screen

Date	# Spaces	Magnification
5/4/2005	34.2	9789

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	9.33	9.13

Small Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	0.93	0.913

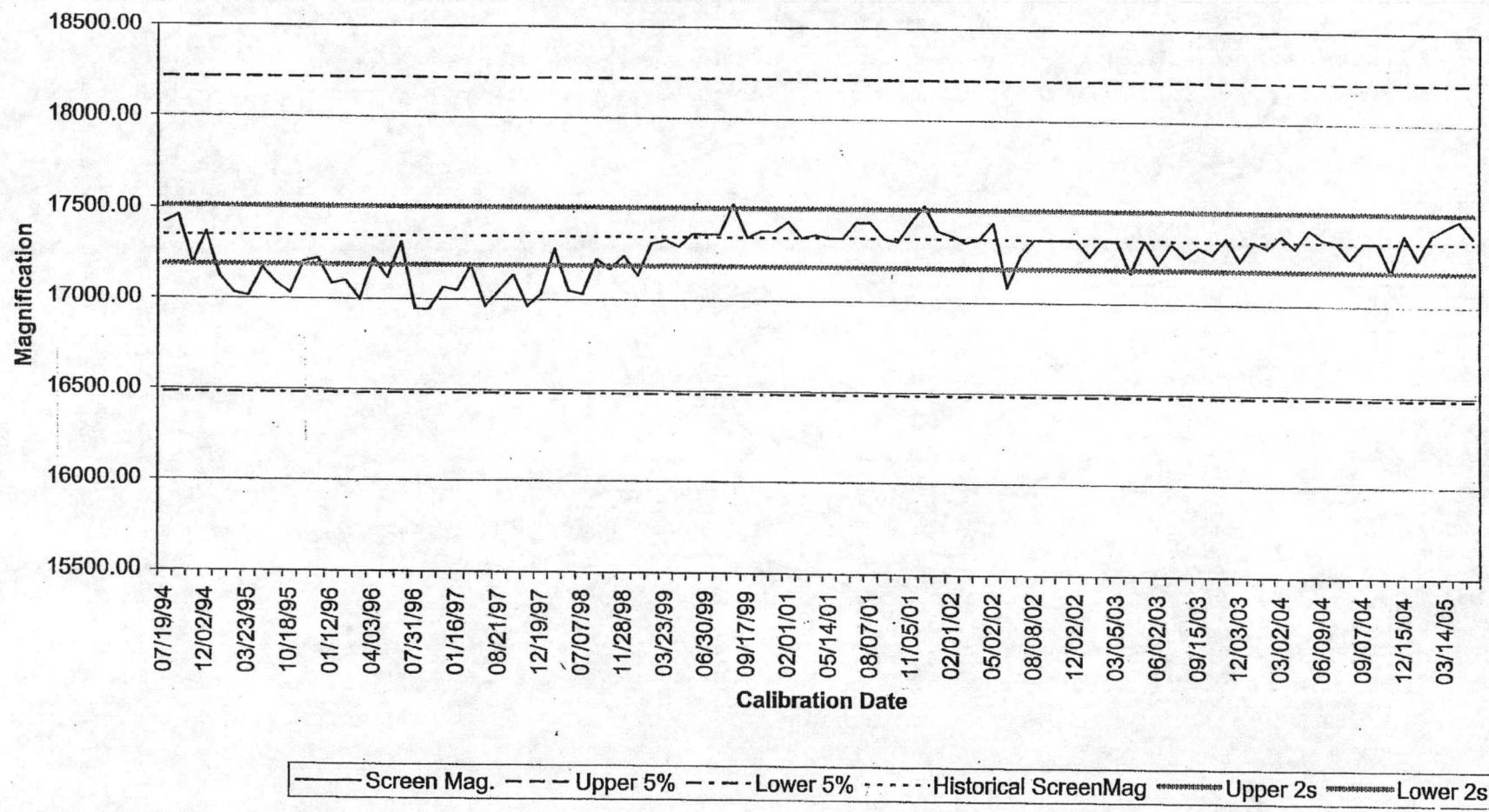
Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	8.17	8.00	0.102	1.022

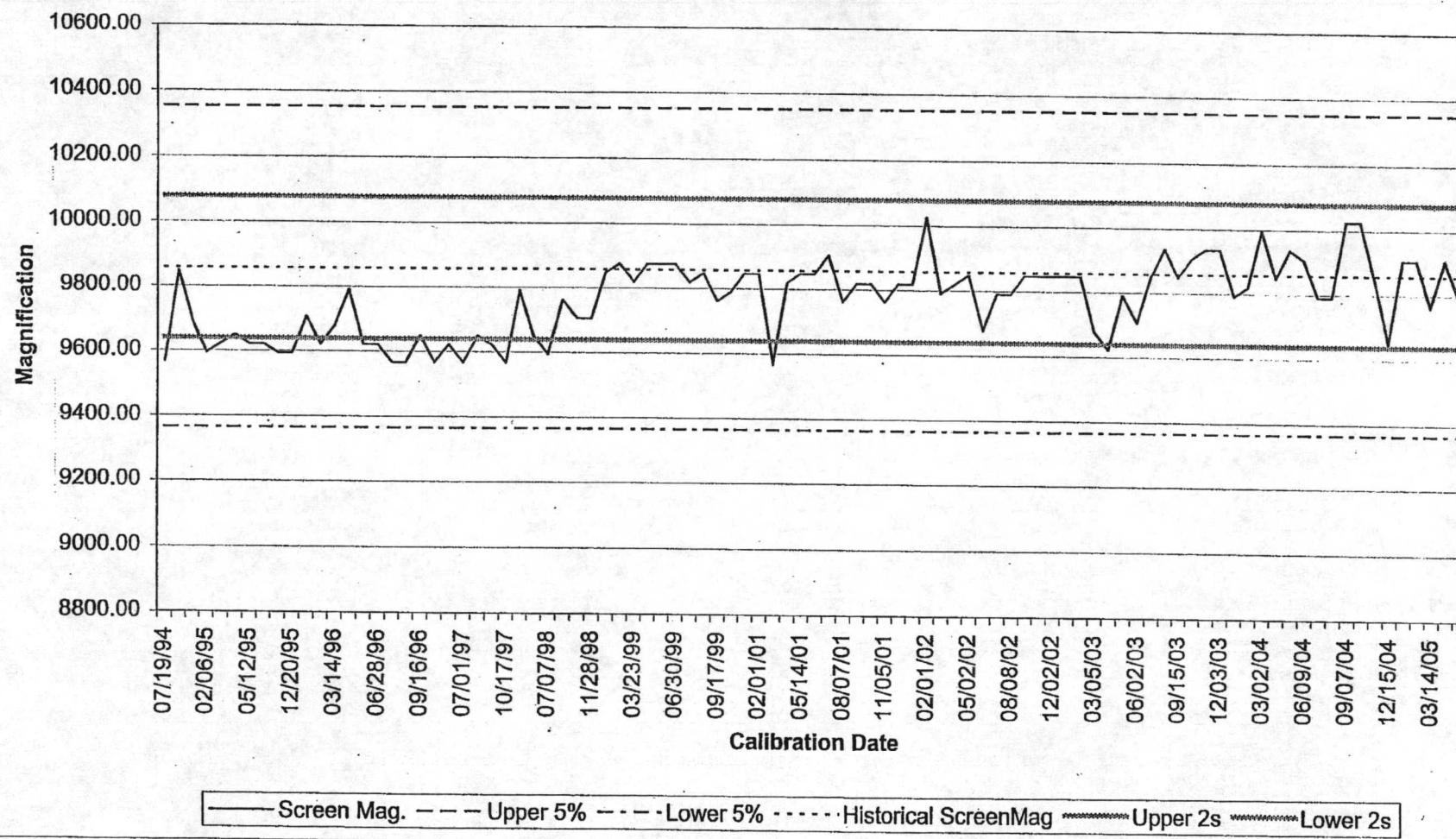
Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Screen Magnification = $(155/\# \text{ spaces}) * 2160$

Philips 410 - Screen Magnification Calibration
Setting 18,000
07/94 to 05/05



Philips 410 - Screen Magnification Calibration
Setting 10,000
07/94 to 05/05

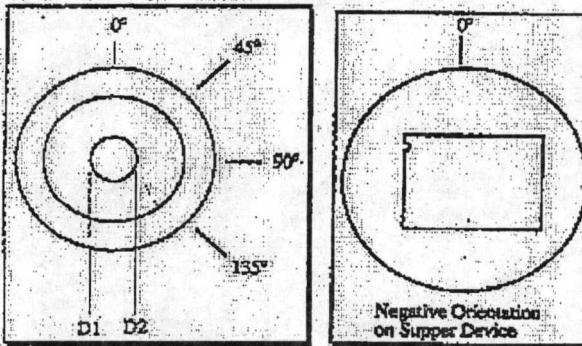


Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/8/2005	Average Camera Constant:	26.6 mmA
Negative Number:	5903	(All 12 Measurements)	
Date Negative was Taken:	5/5/2005	Average Camera Length:	718.93 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	74.10	96.45	22.35	11.18	26.32	711.27	80.15	102.60	22.45	11.23	26.43	714.46
2	72.50	98.35	25.85	12.93	26.35	712.27	78.30	104.30	26.00	13.00	26.51	716.41
3	67.00	103.55	36.55	18.28	26.35	712.23	72.85	109.65	36.80	18.40	26.53	717.10

Ring #	90 degrees						135 degrees					
	D ₁	D ₂	D	R	CC	CL	D ₁	D ₂	D	R	CC	CL
1	80.25	103.10	22.85	11.43	26.91	727.19	74.85	97.45	22.60	11.30	26.61	719.23
2	78.55	104.90	26.35	13.18	26.86	726.05	73.00	99.10	26.10	13.05	26.61	719.16
3	72.90	110.30	37.40	18.70	26.97	728.79	67.50	104.60	37.10	18.55	26.75	722.95



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D₁ = The smaller measurement on the Supper device (mm).

D₂ = The larger measurement on the Supper device (mm).

$$D = D_2 - D_1$$

$$R = D/2$$

CC = Camera Constant

For Ring 1 [111], CC = R*2.355

For Ring 2 [200], CC = R*2.039

For Ring 3 [220], CC = R*1.442

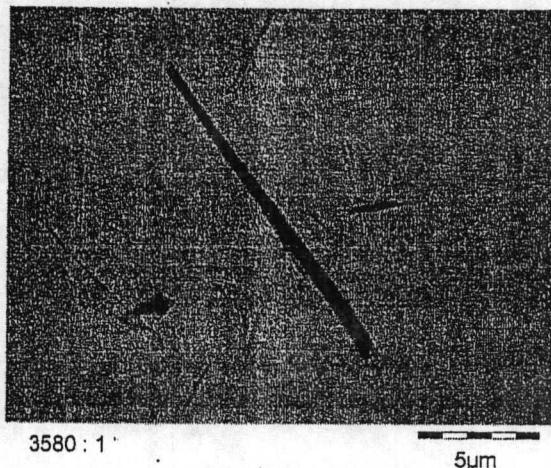
CL = Camera Length = CC/0.037

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Na Crocidolite Std

Neg#[P370]
[5-6-05] ITEM Image

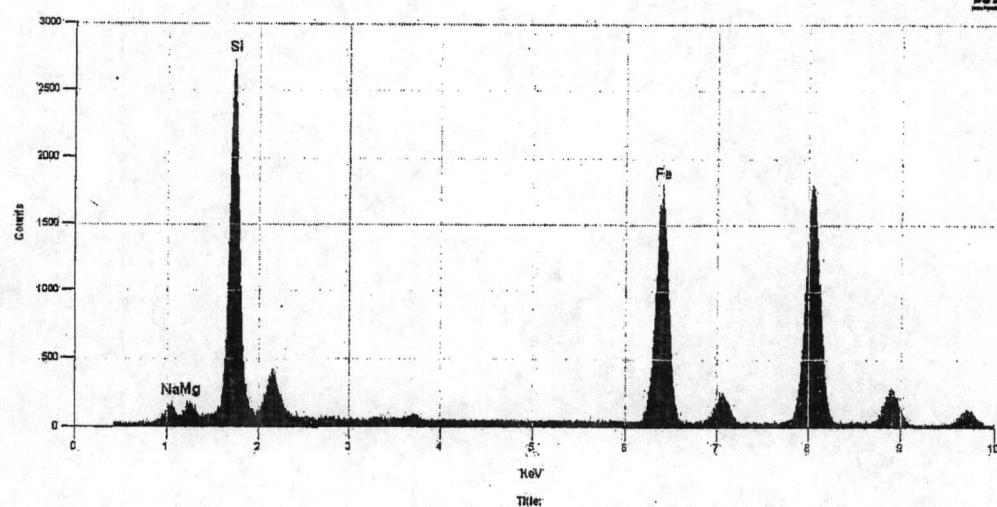
Phil.js



3580 : 1

5μm

WINEDS



Quantitative Analysis Results - Standardless Analysis :
Na Crocidolite Std EDS#16085 Fri, May 06 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 11.02

Element	Atom%	Compound	Weight%	Error(±)	Norm%
Na	3.26	Na2O	4.35	0.39	4.35
Mg	1.76	MgO	3.05	0.25	3.05
Si	21.57	SiO2	55.71	0.74	55.71
Fe	10.75	Fe2O3	36.89	0.71	36.89
<Total>	100.00		100.00		100.00

Na Crocidolite Std. Calibration

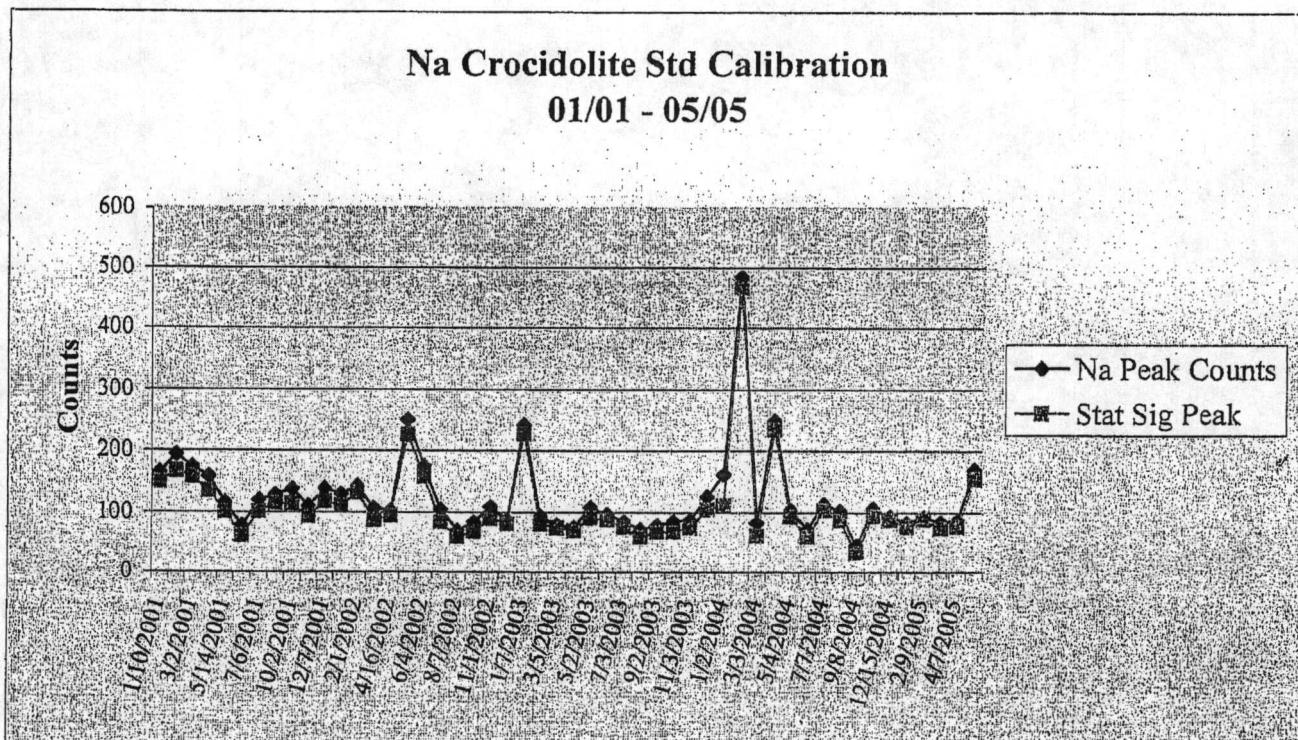
Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
1/10/2001	DW	9707	y	165	67	149.5	Pass
2/2/2001	DW	9753	y	193	71	167.5	Pass
3/2/2001	DW	9819	y	174	71	158	Pass
4/4/2001	DW	10012	y	158	56	135	Pass
5/14/2001	DW	10325	y	116	43	101	Pass
6/8/2001	DW	10405	y	78	22	61	Pass
7/6/2001	DW	10481	y	120	41	101	Pass
8/1/2001	DW	10631	y	129	50	114.5	Pass
10/2/2001	DW	10850	y	138	45	114	Pass
11/2/2001	DW	10966	y	110	38	93	Pass
12/7/2001	DW	11054	y	139	48	117.5	Pass
1/2/2002	DW	11121	y	130	45	110	Pass
2/1/2002	DW	11206	y	143	61	132.5	Pass
3/1/2002	DW	11272	y	106	34	87	Pass
4/16/2002	DW	11373	y	103	43	94.5	Pass
5/2/2002	DW	11465	y	250	100	225	Pass
6/4/2002	DW	11530	y	175	71	158.5	Pass
7/1/2002	DW	11799	y	105	31	83.5	Pass
8/7/2002	DW	12319	y	70	24	59	Pass
10/12/2002	DW	12633	y	84	26	68	Pass
11/1/2002	DW	12668	y	109	35	89.5	Pass
12/1/2002	DW	12779	y	88	37	81	Pass
1/7/2003	DW	13008	y	241	106	226.5	Pass
2/7/2003	KM	13078	y	93	34	80.5	Pass
3/5/2003	KM	13164	y	79	35	74.5	Pass
4/3/2003	KM	13225	y	75	32	69.5	Pass
5/2/2003	KM	13340	y	108	37	91	Pass
6/1/2003	KM	13436	y	97	39	87.5	Pass
7/3/2003	KM	13579	y	85	33	75.5	Pass
8/5/2003	KM	13712	y	72	23	59	Pass
9/2/2003	KM	13827	y	79	28	67.5	Pass
10/1/2003	KM	13979	y	85	25	67.5	Pass
11/3/2003	KM	14046	y	87	31	74.5	Pass
12/3/2003	KM	14130	y	126	42	105	Pass
1/2/2004	KM	14176	y	162	31	112	Pass
2/2/2004	KM	14239	y	484	224	466	Pass

3/3/2004	KM	14284	y	83	20	61.5	Pass
4/1/2004	KM	14370	y	249	110	234.5	Pass
5/4/2004	KM	14538	y	104	41	93	Pass
6/8/2004	KM	14818	y	72	24	60	Pass
7/7/2004	DW	14868	Y	114	47	104	Pass
8/3/2004	DW	14932	Y	103	36	87.5	Pass
9/8/2004	KM	15031	Y	45	10	32.5	Pass
11/1/2004	KM	15277	Y	107	41	94.5	Pass
12/15/2004	MQ	15568	Y	93	41	87.5	Pass
1/1/2005	KM	15628	Y	83	35	76.5	Pass
2/9/2005	DW	15915	Y	92	43	89	Pass
3/18/2005	DW	15914	Y	84	32	74	Pass
4/7/2005	MQ	16007	Y	87	33	76.5	Pass
5/6/2005	DW	16085	Y	170	70	155	Pass

*ND - Not Done

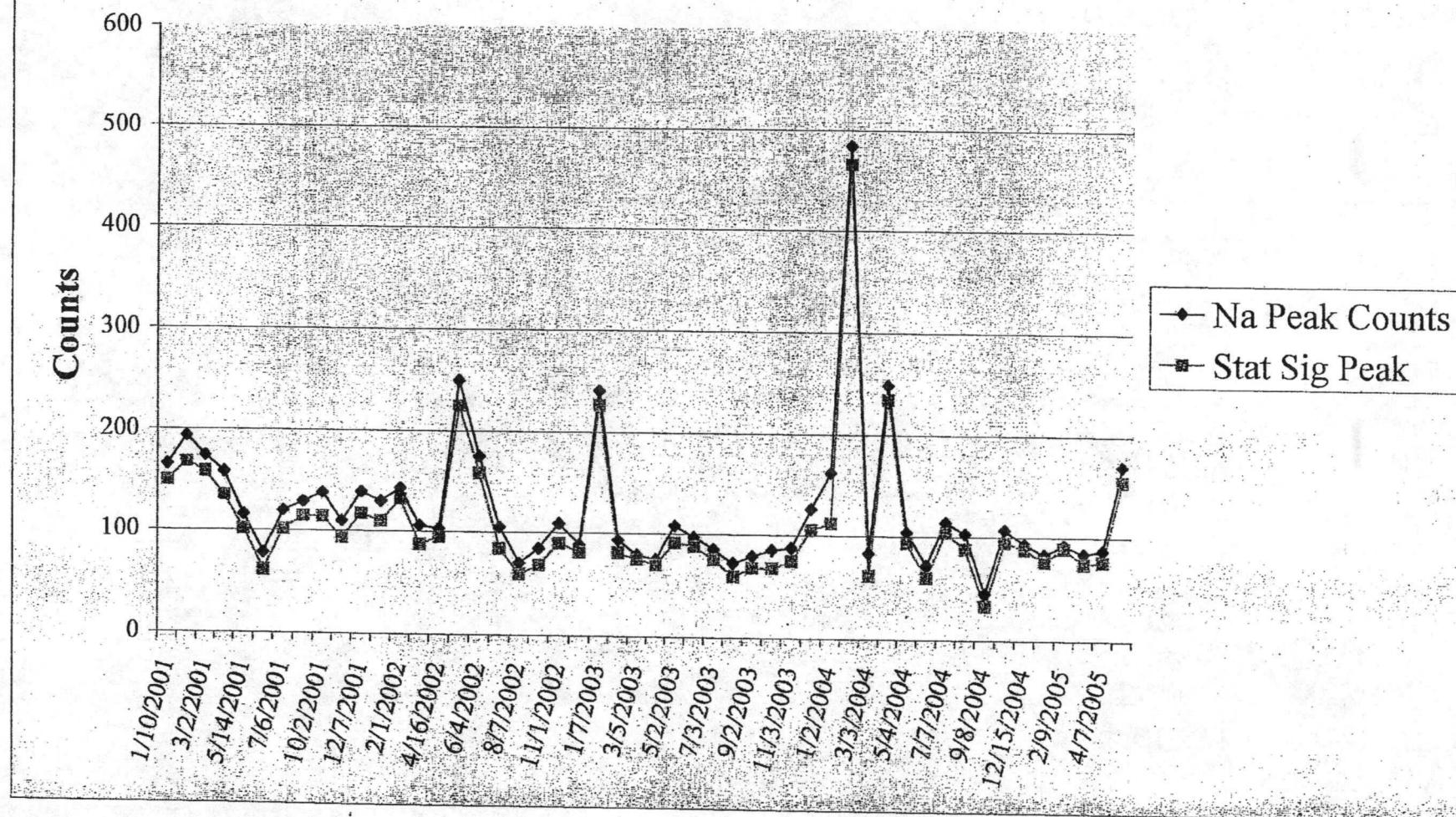
** Peak count is the maximum Na peak count

***Background peak count is the base, right of the Na peak



Na Crocidolite Std Calibration

01/01 - 05/05

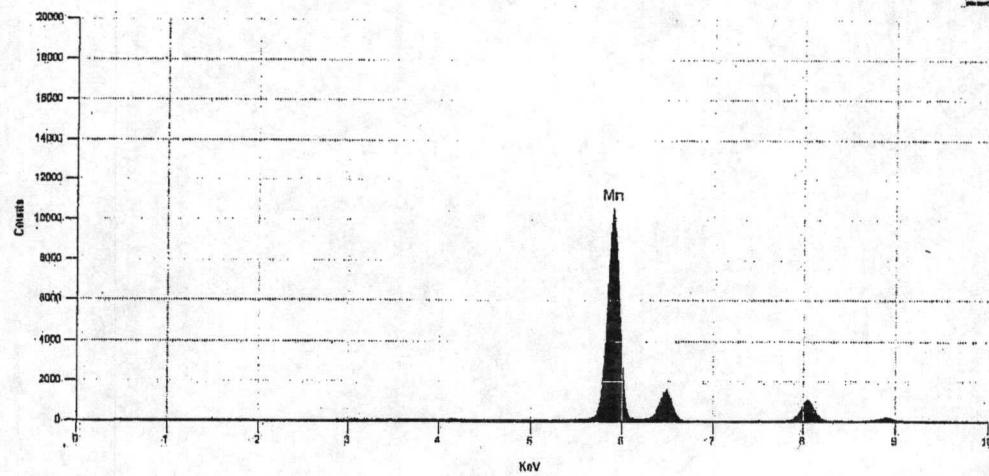


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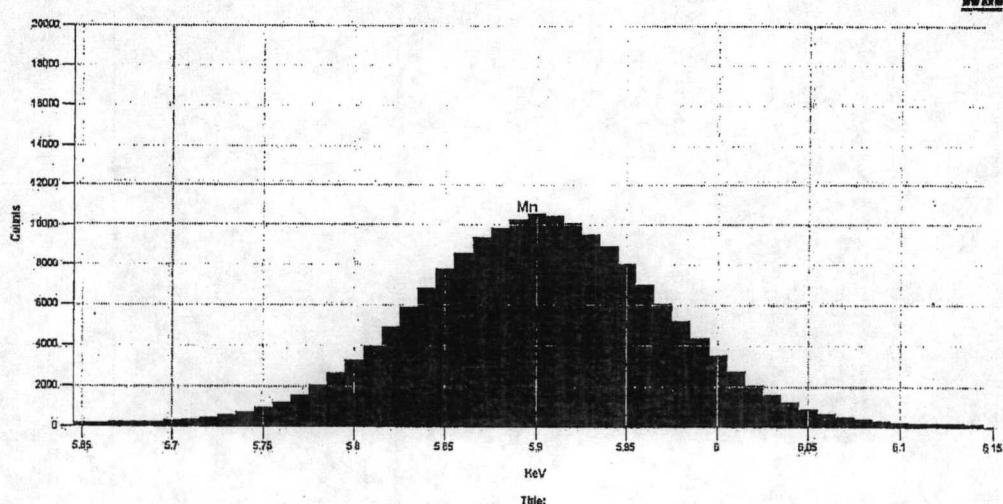
Mn Monthly Std
EDS#[16086]
[5-6-05] ITEM Image

philip

WINEDS



WINEDS



Peak Statistics : EDS# 16086

Peak	Energy	Height	FWHM	Area
1	5.901	10321	153	168997
2	6.491	1473	161	25353
3	8.046	1053	166	18668

7619 6th Avenue NW, Seattle, WA 98117

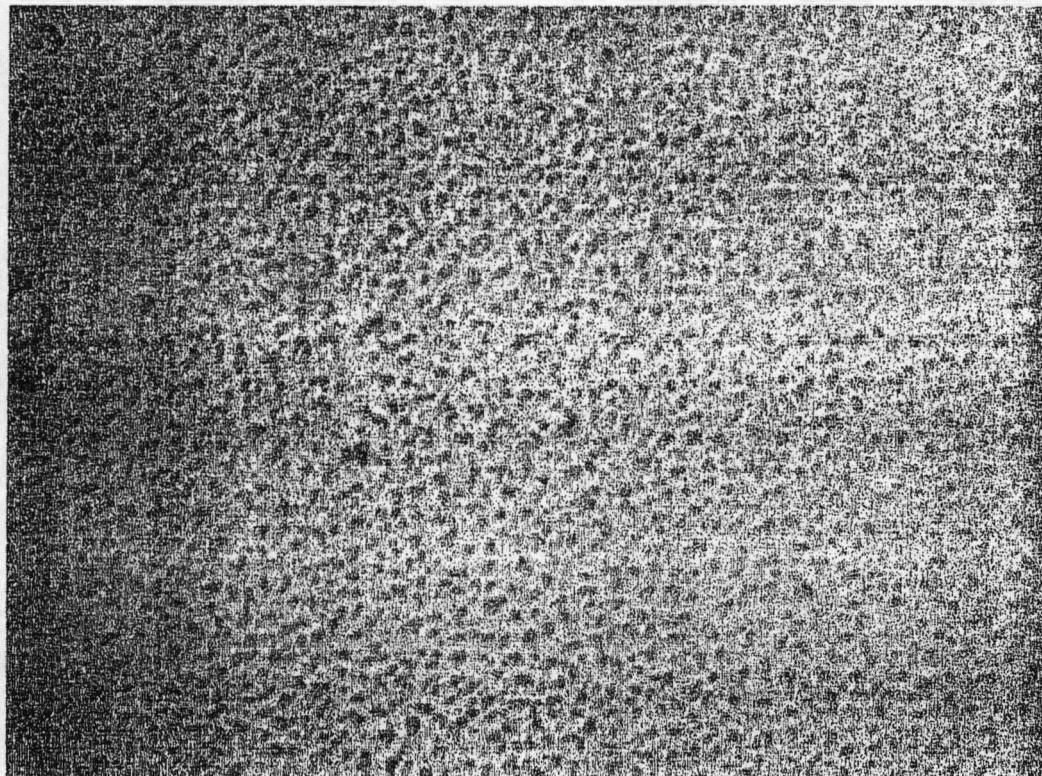
www.labcor.net Phone: (206) 781-0155 (Office) Fax: (206) 789-8424 E-mail: mail@labcor.net

BEAM DOSE CALIBRATION				
Date:			5/6/2005	
Analyst:			DW	Image # <i>Philips</i>
Fiber Length used in analysis:			1.2 x 0.1 um	P374
Time (sec)	Visual	Neg #	Recordable Diffraction	EDS
0	Y	ND*	ND*	
30	Y	ND*	ND*	
60	Y	P371	Y	
90	Y	P372	Y	
120	Y	P373	Y	16088
PASS/FAIL	PASS		PASS	
*ND - Not Done				
Visual - Mark "Y" if diffraction pattern is seen on screen, mark "N" if pattern is not seen on screen				
Recordable Diffraction - Mark "Y" if diffraction pattern is seen on negative, mark "N" if pattern is not seen on negative				
Chrysotile Fiber Specs.: Single fibril, >= 1.0 micron in length				

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Plasma Etch Rate
L/C Batch# 050450
4 Minute Etch Rate
3/18/05



The hard copy of the additional information for this data package including:

- QC Summary
- QC Package (microscope logs and calibrations)
- Sample preparation logs

can be found in the file for Data Package 041172R07.

The information can also be found on the CD under
From Lab\Data Package\QC and Additional Information